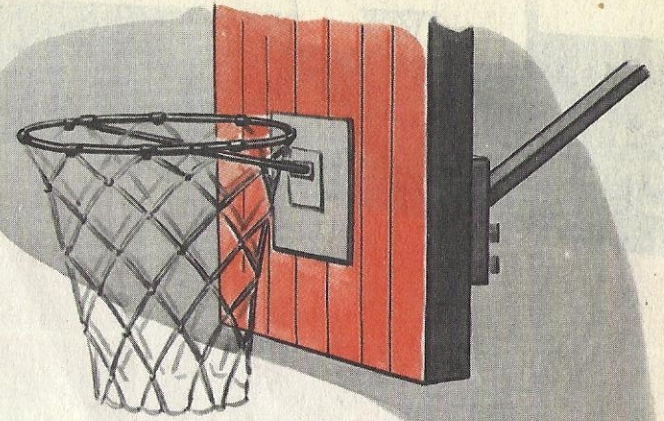




Cage ★ ★ ★ ★ Champions ★ ★ ★ ★

Adventures with numbers

Part 1 of 2

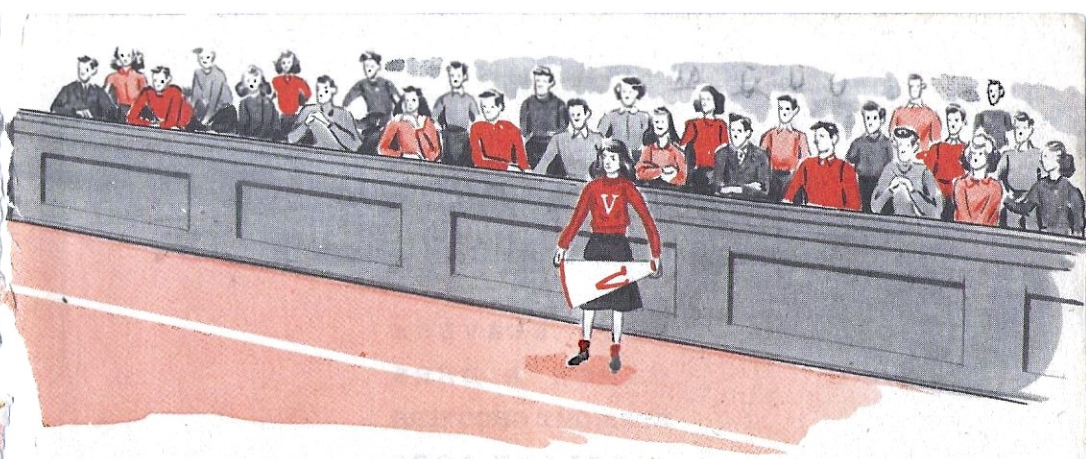


Cage Champions





Cage



Champions

Adventures with numbers

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★ ★ ★ ★ ★ ★ ★ ★

Webster Publishing Company

SAINT LOUIS • ATLANTA • DALLAS • LOS ANGELES

Adventures with numbers.

IN ORDER OF INCREASING DIFFICULTY

BUSY BEAVERS

RANGE RIDERS

STRAIGHT SHOOTERS

AIRPLANE ACES

HOME RUN HITTERS

CAGE CHAMPIONS

• • •

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★ Preface

Plan of Series. Adventures with Numbers is unique in organization. Each book has a motif taken from the pupils' world and captivating to the pupil. The motif furnishes the book's title. Young learners assume the role of Busy Beavers or Range Riders as they experience adventures with numbers. The boy or girl who is a little older plays that he is on the rifle range or piloting a plane as he gains further skill and understanding. The upper grade pupil takes part in a make-believe ball game, the rules and the scores of which provide motivation and sliding measures of achievement. Emphasis is placed on crediting the pupil with what he does correctly, without undermining his confidence when he fails to make a perfect total score, or the hypothetical 100%.

Unit Organization. Each book is divided into twelve units, each unit a little book in itself, with presentation of new material, practice in computation, and helps in problem solving. Pages of races, drills, and problems, with like captions and illustrations, occur in each unit of a book. The four closing pages of a unit are:

- a. Test on material of unit, with a goal.
- b. Helps for those who failed to reach goal a.
- c. Challenges for those who did reach goal a.
- d. Final unit test, geared to average pupil.

The first and seventh units of each book are given largely to reviewing and reteaching. Thus, twice a year, there are systematic campaigns to strengthen foundations so that the pupil can go into new work with new confidence, even though there have been gaps in his earlier work.

Non-Discriminating Differentials. Careful provisions are made for pupils with different learning rates. This is done in such a way as not to foster a superior attitude on the part of the fast learner nor to embarrass the one who learns slowly. Among the beavers, one who mends the wall can take as much pride in his work as the one who builds it higher. In basketball, one who recovers the ball is as valuable to the team as one who passes the ball. There is no higher nor lower with the pupil who does his best with the work that is appropriate for him. In Adventures with Numbers, there is differentiation without discrimination.

Individualized Program. Directions are addressed to pupils. Pupils are asked to choose partners, or to divide into groups or teams to do specific tasks.

They mark each other's papers and go on to the next task. This builds up a feeling of responsibility on the part of the pupil, and helps to release the teacher from constant direction of the class so that she can give help where it is most needed. The range between the slow learner and the fast learner in the average class is great. This series provides material and a plan so that the teacher can guide each pupil along at his own rate, rather than merely "covering" the material judged appropriate for the average pupil.

Readiness. Experience and experiments show that pupils do not become ready of themselves. We also know that teaching is wasted when the pupil is not ready. A program of preparing the pupil for each next step is skillfully woven into Adventures with Numbers. The «times-and» facts precede carrying in multiplication; station numbers precede uneven division. A boy's bicycle repair shop grows into a partnership and into a small corporation before stocks and bonds are presented. No process or idea is introduced until the pupil has been conditioned for it.

Presentation of New Concepts. Meanings, skills, and processes that are most difficult for the child to grasp are usually the ones that are most difficult to present clearly in a text. An author is tempted to be satisfied with something that he knows is inadequate, and to hope that teacher and pupil can fill in what is lacking. In Adventures with Numbers, no effort has been spared to present each new idea clearly and adequately. A pupil is not stopped today by the height of the ultimate goal in arithmetic, but by some little point in today's lesson that is not clear to him. Our presentations make the steps short and leave no gaps.

Using Arithmetic. A pupil may excel in book computation or book problems, and fail to see that the purpose of what he learns in school is to help him outside of school. He fails to carry what he learns in the little world within the school to the big world on the outside. Adventures with Numbers guides the pupil to the use of arithmetic in his everyday affairs, and helps him see arithmetic as a part of his whole self and not just a part of his school self.

Importance of Arithmetic. Quantitative thinking plays a more decisive role in our age than ever before. This is an age of number, measurement, science, and technology. The pupil who leaves school deficient in arithmetic is blocked from entering many fields. He will be handicapped in his efforts to earn a good living, or to buy most with what he does earn. For the individual who will carry his load and for the nation, arithmetic is truly an important part of the education for survival.

★★★★★★ Contents

Unit I. Pages 1-26

Reading, writing, adding, subtracting, multiplying, dividing, and rounding of whole numbers and decimals. Problem solving.

Unit II. Pages 27-52

Using fractions and mixed numbers. Additional practice with decimals. Problem solving.

Unit III. Pages 53-78

Meaning and use of per cents. Applications of percentage. Problem solving.

Unit IV. Pages 79-104

Banking practice and forms. Time between dates. Bank discount. Interest and interest tables. Problem solving.

Unit V. Pages 105-132

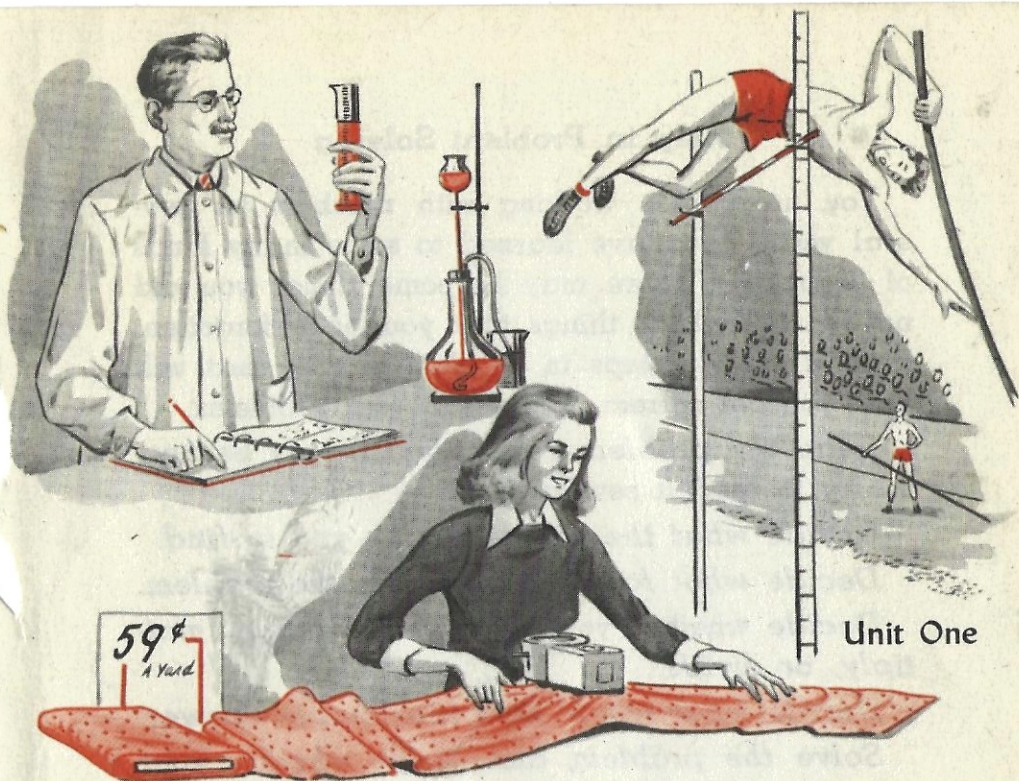
Budgets and accounts. Saving and investing. Making a business pay. Corporation stock. Problem solving.

Unit VI. Pages 133-156

Government and corporation bonds. Bond interest. Other forms of saving. Problem solving.

Unit VII. Pages 157-182

Inventories. Business terms and practices. Problem solving.



Whether at work or play, persons and groups find many uses for arithmetic. The scientist needs arithmetic to make exact measurements and computations. To make a profit, business concerns must measure accurately and work their problems correctly, and their customers must know arithmetic to spend their money wisely. The athlete uses measures and scores, often winning by a fraction of an inch, or a split second. In fact, you cannot live in this modern world of science, business, buildings, dams, and bridges without constant uses of numbers, forms, and measurement.

Help in Problem Solving

You have been working with numbers for several years and have learned to solve many kinds of problems. There may be some things you did not learn well, or things that you have forgotten. Here are some steps in problem solving that will help you get correct answers to your problems.

Read the problem carefully. It may be necessary to read it several times.

Decide what the problem asks you to find.

Decide what facts are given in the problem.

Decide whether you must add, subtract, multiply, or divide.

Decide what would be a reasonable answer.

Solve the problem, and decide whether your answer is reasonable.

Practice estimating reasonable answers. Read each of the following problems carefully. Then choose a reasonable answer from the four numbers given after the problem. Solve the problem and compare your answer with the one you chose as a reasonable answer.

1. Birthday greeting cards cost \$.15 each. How much will 25 cards cost?

\$.40 \$.10 \$3.75 \$1.50

2. Tom had \$1.63. He earned \$.85. How much did he then have?

\$.78 \$2.48 \$248 \$24.80

3. Mr. Alt had \$300 in the bank. He drew out \$9. How many dollars were left?

\$2700 \$291 \$29.01 \$2991

4. A dealer bought 50 gallons of motor oil and sold it by the quart. How many quarts would this amount make?

200 qt. 100 qt. 46 qt. 4 qt.

5. Bill cut a piece $3\frac{2}{3}$ ft. long from a 14-ft. board. How long was the remaining piece of board?

$17\frac{2}{3}$ ft. $51\frac{1}{3}$ ft. 3 ft. $10\frac{1}{3}$ ft.

6. The airplane fare between two cities is \$55.60. The train fare for the same trip is \$32.75. How much less does it cost to make the trip by train?

\$88.35 \$128.50 \$22.85 \$1285

7. Mr. West deposited checks for \$3.75, \$25.85, and \$100 to his account. What was the total amount deposited?

\$129.60 \$30.60 \$12.96 \$103.75

8. At an average of 16 miles per gallon, how many miles can you drive your car on 16 gallons of gas?

1 mi. 32 mi. 256 mi. 160 mi.

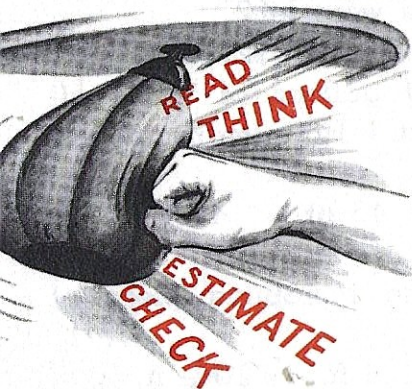
9. One fifth of Ted's money is \$.36. How much money has he?

\$180 \$1.80 $$.07\frac{1}{5}$ $$.35\frac{1}{4}$

10. A 5-dollar sweater sold for \$3.75. What was the discount?

\$1.75 \$1.25 \$125 \$18.75

Gaining Strength in Problem Solving



No pencils, please.

Think: Must I add, subtract, multiply or divide? Then find the answer.

1. Tom had a balance of \$41.30 in the bank. He deposited \$12.50 to his account. How much did he then have in the bank?

2. How many square feet will 9 gallons of paint cover, if 1 gallon covers 300 sq. ft.?

3. Jack worked 30 hours and earned \$9.00. How much did he earn per hour?

4. Tom drove an average of 45 mi. an hour on a trip. How far did he travel in 5 hr.?

5. A dealer allowed Mr. Smith \$580 for his old car. If his new car cost \$1200, how much cash did Mr. Smith have to pay?

6. Mr. Jackson pays $\frac{1}{5}$ of his income for rent. His yearly income is \$3500. Find his yearly rent.

7. How much will Mary earn in 12 weeks if she earns \$9 a week?

8. A room is 21 ft. long and 15 ft. wide. How many square feet does the floor contain?

9. A ball park can seat 4,800 persons. When 4,250 attend the game, how many seats are empty?

10. At 54¢ a dozen, what will one orange cost?

When You Use Addition

1. Mr. Brown owes \$1500 on his house, \$50 to his doctor, \$448.75 to his bank, and \$125.50 on his car. What is his total debt?

Addition	Add down	Check by adding up
$ \begin{array}{r} \$1500.00 \\ 50.00 \\ 448.75 \\ 125.50 \\ \hline \$2124.25 \end{array} $	$\downarrow$	$\uparrow$
$\left. \begin{array}{l} \$1500.00 \\ 50.00 \\ 448.75 \\ 125.50 \end{array} \right\} \text{addends}$		
$\xrightarrow{\text{sum}}$		

2. Mr. Smith owns a home worth \$7500, a car worth \$875, household furniture worth \$990, and \$500 worth of bonds. What is the combined value of all this property?

Addition is used to find the total or combined value of two or more numbers.

Before you add be sure that each figure is written in its right place.

Keep columns straight.

Keep decimal points directly under each other.

When there is a dollar sign, write it before the first addend and before the sum.

billions	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones or units	tenths	hundredths
\$	2	4	2	7	,	6	2	7	,	4	2
										8	.
										0	9

5

Addition Practice

1. Write these numbers in a column, and add.

7 billion 423 million 6 thousand 4
125 thousand 112 and 7 hundredths
5 million 200 and 50 hundredths

2. Write in a column and add.

93 billion 389 million 56 dollars
726 thousand 45 dollars and 5 cents
7 thousand dollars and 45 cents
89 dollars

3. Write in a column and add.

3 million 125 thousand 9
2 billion 17
4 billion 7 million 400 thousand

4. Make a list of ten ways in which addition is commonly used. Checking a grocery bill at home is certainly one of them.

Addition is so common in everyday life that everyone should be able to add quickly and accurately. Test your addition in this way.

Choose a partner. Work Test 1A on page 7 while he works Test 1B. Exchange papers and check. If either of you made mistakes, practice pages 316-318. Then work Test 1B on page 7 while your partner does Test 1A. Check. Who finished first? Were all his sums correct?

Speed is important, but accuracy comes first!

Addition of Whole Numbers

Test 1A (316-318)

Find the sums:

1. $11+3+6+8$ 2. $13+42+25+19$
3. $76+198+6+240$ 4. $700+17+538+93$

5.	6.	7.	10.	11.	12.
78	439	8,049	5	28	739
<u>27</u>	<u>84</u>	<u>7,953</u>	8	4	84
			4	39	602
			6	80	75
8.	9.		3	67	9
8,643	78,630		2	8	830
<u>9,867</u>	<u>9,707</u>		9	5	76
<u>5,006</u>	<u>239,457</u>			<u>73</u>	<u>7</u>

Test 1B

Find the sums:

1. $37+5+3+9$ 2. $31+52+74+16$
3. $95+206+7+173$ 4. $300+28+431+65$

5.	6.	7.	10.	11.	12.
94	376	5,098	7	93	548
<u>39</u>	<u>85</u>	<u>3,886</u>	4	8	27
			6	54	307 ✓
			9	70	84
8.	9.		4	38	7
8,643	78,994 ✓		5	5	330
<u>3,009</u>	<u>7,540</u>		8	72	94
<u>7,349</u>	<u>456,779</u>			<u>37</u>	<u>9</u>



Making Change by Addition

1. Ann sold a vase for \$.79. The buyer gave her a 5-dollar bill. She took a pencil and began subtracting to find the change. Bill showed her how to figure change by adding.

Poor way

$$\begin{array}{r} \$5.00 \\ .79 \\ \hline \$4.21 \end{array}$$

Better way

Give the customer:

1¢ (\$0.01) to make 80¢
2 dimes (0.20) to make \$1.00
4 dollars (4.00) to make \$5.00
\$4.21

2. What coins and bills would Ann give a customer who bought a waste basket for \$1.35 and gave her a 10-dollar bill?

What coins and bills would you give in change for the following purchases?

3. Bought a 15¢ ash tray; gave a \$1 bill.
4. Bought a lamp for \$2.95; gave a \$10 bill.
5. Bought a book for \$.29; gave a \$2 bill.
6. Bought a plate for \$.55; gave a \$1 bill.

Why ought you know how to make change?

Do you always count your change before leaving the counter? Why?

Using Subtraction

When you are solving problems you will use subtraction to find any one of the following three things:

How much or how many are left after a smaller number is taken, or subtracted, from a larger number.

How much smaller or larger one number is than another.

How much or how many must be added to a smaller number to make it equal a larger one.

Tell which of the three uses of subtraction each of the following problems illustrates.

1. The fuel tank of a clipper holds 5400 gal. when full. When there are 1230 gal. in the tank, how many gallons must be added to fill it?

2. Mr. Main owed a bill of \$201.34. He made a payment of \$68.50. How much did he have left to pay?

3. The cash price of a radio is \$49.50. If bought on the installment plan the radio will cost \$55.40. The cash price is how much less than the amount paid in installments?

4. Mr. Ames had \$12,602.75 in his checking account. He cashed a check for \$124.85. How much was left in his account?

5. A man bought a \$1200 car. He was allowed \$785 for his old car. How much cash did he pay?

Subtraction Practice

1. Jerry made a payment of \$15.85 on a \$29.95 bicycle. How much did he still owe?

Subtraction		Check
<u>\$29.95</u> <i>minuend</i>		<u>\$14.10</u>
<u>15.85</u> <i>subtrahend</i>		<u>15.85</u>
<u>\$14.10</u> <i>remainder or difference</i>		<u>\$29.95</u>

In subtraction the dollar sign is written before the minuend and the remainder.

Keep decimal points under each other.

2. In a popularity contest the four most popular screen actors received the following number of votes:

Mr. J 318,734 Miss G 352,350

Mr. T 229,463 Miss Y 324,822

By how many votes did the winner lead? How many less votes than Miss G did Mr. T receive? How many more votes did Mr. T need to tie Mr. J?

3. *Test your subtraction skill.* Work Test 2A on page 11 while a partner works Test 2B. If either of you made mistakes, practice pages 319-320. When you feel you have improved your subtraction, work Test 2B while your partner works 2A.

4. *Time your subtraction.* Keep time for your partner while he works Test 2A. Have him keep time while you do Test 2B. Who took the shorter time? Check papers. Can both of you work fast and correctly, too?

Subtraction of Whole Numbers

Test 2A (319-320)

Subtract:

- | | | | | |
|--|--|---|---|---|
| 1. $\begin{array}{r} 84 \\ 27 \\ \hline \end{array}$ | 5. $\begin{array}{r} 364 \\ 125 \\ \hline \end{array}$ | 9. $\begin{array}{r} 763 \\ 85 \\ \hline \end{array}$ | 13. $\begin{array}{r} 6,924 \\ 2,543 \\ \hline \end{array}$ | 17. $\begin{array}{r} 73,904 \\ 8,885 \\ \hline \end{array}$ ✓ |
| 2. $\begin{array}{r} 93 \\ 8 \\ \hline \end{array}$ | 6. $\begin{array}{r} 735 \\ 272 \\ \hline \end{array}$ | 10. $\begin{array}{r} 947 \\ 8 \\ \hline \end{array}$ | 14. $\begin{array}{r} 8,070 \\ 2,345 \\ \hline \end{array}$ | 18. $\begin{array}{r} 91,562 \\ 76,491 \\ \hline \end{array}$ ✓ |
| 3. $\begin{array}{r} 54 \\ 49 \\ \hline \end{array}$ | 7. $\begin{array}{r} 845 \\ 396 \\ \hline \end{array}$ | 11. $\begin{array}{r} 382 \\ 291 \\ \hline \end{array}$ | 15. $\begin{array}{r} 9,003 \\ 2,094 \\ \hline \end{array}$ | 19. $\begin{array}{r} 40,000 \\ 29,603 \\ \hline \end{array}$ |
| 4. $\begin{array}{r} 80 \\ 32 \\ \hline \end{array}$ | 8. $\begin{array}{r} 905 \\ 237 \\ \hline \end{array}$ | 12. $\begin{array}{r} 4,730 \\ 453 \\ \hline \end{array}$ | 16. $\begin{array}{r} 7,300 \\ 205 \\ \hline \end{array}$ | 20. $\begin{array}{r} 80,201 \\ 293 \\ \hline \end{array}$ |

Test 2B

Subtract:

- | | | | | |
|--|--|---|---|---|
| 1. $\begin{array}{r} 53 \\ 14 \\ \hline \end{array}$ | 5. $\begin{array}{r} 731 \\ 217 \\ \hline \end{array}$ | 9. $\begin{array}{r} 815 \\ 96 \\ \hline \end{array}$ | 13. $\begin{array}{r} 4,339 \\ 1,419 \\ \hline \end{array}$ | 17. $\begin{array}{r} 81,420 \\ 2,885 \\ \hline \end{array}$ ✓ |
| 2. $\begin{array}{r} 74 \\ 8 \\ \hline \end{array}$ | 6. $\begin{array}{r} 834 \\ 445 \\ \hline \end{array}$ | 10. $\begin{array}{r} 731 \\ 4 \\ \hline \end{array}$ | 14. $\begin{array}{r} 7,943 \\ 5,874 \\ \hline \end{array}$ ✓ | 18. $\begin{array}{r} 73,318 \\ 69,009 \\ \hline \end{array}$ ✓ |
| 3. $\begin{array}{r} 75 \\ 67 \\ \hline \end{array}$ | 7. $\begin{array}{r} 653 \\ 275 \\ \hline \end{array}$ | 11. $\begin{array}{r} 955 \\ 870 \\ \hline \end{array}$ | 15. $\begin{array}{r} 8,348 \\ 1,009 \\ \hline \end{array}$ | 19. $\begin{array}{r} 50,010 \\ 19,004 \\ \hline \end{array}$ |
| 4. $\begin{array}{r} 31 \\ 20 \\ \hline \end{array}$ | 8. $\begin{array}{r} 304 \\ 245 \\ \hline \end{array}$ | 12. $\begin{array}{r} 842 \\ 85 \\ \hline \end{array}$ | 16. $\begin{array}{r} 6,100 \\ 4,002 \\ \hline \end{array}$ ✓ | 20. $\begin{array}{r} 70,302 \\ 395 \\ \hline \end{array}$ |

Using Multiplication

1. The air-line fare between two cities is \$123.56. What will be the cost of 3 fares?

Addition

$$\begin{array}{r} \$123.56 \\ 123.56 \\ 123.56 \\ \hline \$370.68 \end{array}$$

Multiplication

$$\begin{array}{r} \$123.56 \text{ multiplicand} \\ 3 \text{ multiplier} \\ \hline \$370.68 \text{ product} \end{array}$$

Multiplication is a short form of addition. *Multiplication is used to find the combined or total value of two or more equal amounts.*

2. At 16 mi. to the gallon, how far can you travel on 21 gal. of gasoline?

Multiplication

$$\begin{array}{r} 16 \text{ mi.} \\ 21 \\ \hline 16 \\ 32 \\ \hline 336 \text{ mi.} \end{array}$$

Check

$$\begin{array}{r} 21 \\ 16 \\ \hline 126 \\ 21 \\ \hline 336 \end{array}$$

Check

$$\begin{array}{r} 21 \\ 16 \\ \hline 16 \overline{)336} \\ 32 \\ \hline 16 \\ \hline 16 \end{array}$$

To check multiplication, exchange the places of the multiplicand and multiplier and *multiply again, or divide the product by the multiplier.*

3. Test your multiplication by working Test 3A while a partner works Test 3B. Do practice on pages 321-323 if you make mistakes. Then work Test 3B while your partner works 3A. Check.

Multiplication of Whole Numbers

Test 3A (321-323)

Multiply:

- | | | | |
|-------------|---------------|-----------------|----------------------|
| 1. 28
6 | 5. 738
4 | 9. 8432
7 | 13. 20×8
160 |
| 2. 70
9 | 6. 604
8 | 10. 7006
5 | 14. 300×9
2700 |
| 3. 39
43 | 7. 758
62 | 11. 3808
39 | 15. 40×60
2400 |
| 4. 82
50 | 8. 943
205 | 12. 7214
438 | 16. 80×58
4640 |
| | | | 17. 90×400
36000 |
| | | | 18. 70×302
21140 |
| | | | 19. 600×125
75000 |
| | | | 20. 408×30
12240 |

Test 3B

- | | | | |
|-------------|---------------|-----------------|-----------------------|
| 1. 54
7 | 5. 637
5 | 9. 9743
9 | 13. 40×9
360 |
| 2. 60
4 | 6. 509
7 | 10. 8006
8 | 14. 600×4
2400 |
| 3. 73
39 | 7. 595
54 | 11. 7104
74 | 15. 30×70
2100 |
| 4. 78
40 | 8. 764
307 | 12. 3050
504 | 16. 50×46
2300 |
| | | | 17. 80×300
24000 |
| | | | 18. 60×608
36480 |
| | | | 19. 800×250
200000 |
| | | | 20. 704×50
35200 |

Using Division

Division is used for either of two purposes:
To compare one number with another, as—

How many times is 3 contained in 12?

Three is what part of 12?

What is the ratio of 3 to 12?

To find one of the equal parts, as—

Find $\frac{1}{3}$ of a number.

Find the average of 3 numbers.

1. At \$3 each, how many tennis rackets can be bought for \$12?

Division

Check by multiplication

$$\begin{array}{r} 4 \text{ quotient} \\ \text{divisor } 3 \overline{)12} \text{ dividend} \end{array}$$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$$

2. Don paid \$3 down on a \$12 pair of baseball shoes. What part did he pay?

To find what part one number is of another, write the numbers in the form of a fraction having the part as the numerator and the whole as the denominator, and reduce to lowest terms.

$$\frac{\text{numerator}}{\text{denominator}} = \frac{\text{part}}{\text{whole}} = \frac{3}{12} = \frac{1}{4} \text{ paid down}$$

3. Mary got 45 words right on a spelling test of 50 words. What part did she get right?

Comparison Using Division

1. There were 6 boys and 10 girls at a picnic. Compare the number of boys with the number of girls.

We may compare by subtraction or division. By subtraction there were 4 fewer boys than girls.

By division there were $6 \div 10 = \frac{6}{10} = \frac{3}{5}$ as many boys, or 3 boys to every 5 girls.

When you compare numbers by division, you are using a ratio.

The two numbers to be compared are called the **terms** of the ratio.

The value of a ratio is found by dividing the first term by the second. It is best to express a ratio in lowest terms.

2. What was the ratio of girls to boys at the picnic?

$$10 \div 6 = \frac{10}{6} = \frac{5}{3}, \text{ or } 5 \text{ to } 3$$

Ratio may be written in any way that division may be written, as, the ratio of 10 to 6 is

$$5 \div 3 \quad 3 \overline{)5} \quad \frac{5}{3} \quad 5:3 \text{ (read 5 to 3)}$$

Find the ratio of—

3. 12 lb. : 18 lb.

7. 36 ft. : 144 ft.

4. \$25 : \$60

8. 56¢ : 28¢

5. \$80 : \$16

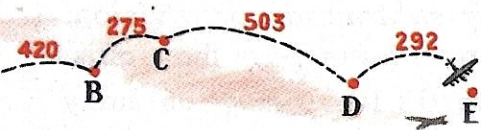
9. 40 qt. : 15 qt.

6. 21 in. : 36 in.

10. 20 bu. : 100 bu.

Dividing to Find the Average

To find the average of two or more amounts, add the amounts, and divide the total by the number of amounts.



1. A plane made four hops as shown on the route map in 8 hr. What was the

average number of miles flown per hour?

2. Six persons boarded a plane. Their fares were \$30.50, \$44.95, \$25.40, \$30.50, \$30.50, and \$18.70 respectively. What was the average fare per person?

3. The passenger space of 5,550 cu. ft. on a clipper is occupied by 74 day passengers. How many cubic feet are allowed per passenger on a flight?

4. If the same clipper space is occupied by 35 passengers on a night flight, what is the average number of cubic feet allowed for each night passenger?

5. A total of 2200 lb. of baggage was put aboard for 55 passengers. What was the average number of pounds of baggage per passenger?

Division Practice

Choose a partner and do the tests on page 17 the same way you did the multiplication tests.

Division of Whole Numbers

Test 4A (324-326)

Divide:

- | | | |
|--------------------------|---------------------------|-----------------------------|
| 1. $8\overline{)5976}$ | 7. $40\overline{)13000}$ | 13. $17\overline{)6885}$ |
| 2. $7\overline{)6596}$ | 8. $70\overline{)29200}$ | 14. $19\overline{)18487}$ |
| 3. $6\overline{)1920}$ ✓ | 9. $32\overline{)13984}$ | 15. $79\overline{)18565}$ |
| 4. $9\overline{)2885}$ ✓ | 10. $71\overline{)42884}$ | 16. $68\overline{)41072}$ |
| 5. $6\overline{)1842}$ ✓ | 11. $63\overline{)26481}$ | 17. $437\overline{)79971}$ |
| 6. $8\overline{)4843}$ | 12. $54\overline{)41660}$ | 18. $874\overline{)352222}$ |

Test 4B

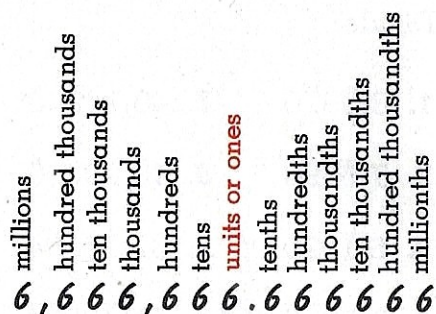
Divide:

- | | | |
|------------------------|---------------------------|----------------------------|
| 1. $7\overline{)6566}$ | 7. $60\overline{)56580}$ | 13. $18\overline{)5571}$ |
| 2. $9\overline{)6381}$ | 8. $90\overline{)63300}$ | 14. $16\overline{)14000}$ |
| 3. $6\overline{)2626}$ | 9. $41\overline{)32226}$ | 15. $87\overline{)61250}$ |
| 4. $8\overline{)4030}$ | 10. $84\overline{)34356}$ | 16. $49\overline{)35280}$ |
| 5. $7\overline{)5045}$ | 11. $79\overline{)15879}$ | 17. $739\overline{)62815}$ |
| 6. $9\overline{)2780}$ | 12. $88\overline{)33000}$ | 18. $597\overline{)24000}$ |

Short Cuts in Multiplication and Division

The value of a figure depends on its place in a number.

Figure 6 at the left of units means sixty; figure 6 at the right of units means six tenths.



Moving a figure one place to the left of its position in a number multiplies it by 10.

1. How will the value of a figure change if it is moved one place to the right of its position in a number?

To multiply a decimal by 10, 100, or 1000, move the decimal point one, two, or three places to the right respectively, adding zeros if necessary.

2. Explain: $10 \times .36 = 3.6$
 $100 \times .36 = 36.$
 $1000 \times .36 = 360.$

3. How many zeros would you add to a whole number to multiply it by 10? By 100? By 1000?

4. Explain: $10 \times 165 = 1,650$
 $100 \times 165 = 16,500$
 $1000 \times 165 = 165,000$

5. Multiply the following numbers by 10; by 100; by 1000.

26.532 9.15 72 .175 .2835 752

To divide by 10, 100, or 1000, move the decimal point 1, 2, or 3 places to the left respectively, prefixing zeros if necessary, as,

$$3.6 \div 10 = .36$$

$$3.6 \div 100 = .036$$

$$3.6 \div 1000 = .0036$$

In whole numbers the decimal point is at the right of units, although it is seldom expressed.

Whole numbers ending in zero may be divided by 10 by crossing off a zero. If two zeros are crossed off from a whole number, by what is the number divided? Three zeros?

6. Divide the following numbers by 10; by 100; by 1000.

350 .45 189.5 9000 .8 .125

7. At \$27 a thousand, what is the cost of a single brick?

8. Mr. West paid \$12.50 for 100 concrete blocks. What was the cost of one block?

9. At \$.015 each, what will 100 cards cost? 1000?

10. One blanket weighs 2.5 lb. What will 1000 such blankets weigh?

Rounding Numbers

1. Bill wanted to remember the population of six large cities. He did not try to remember the exact population. Instead, he thought of the numbers rounded to the nearest thousand. Give the following populations rounded to the nearest thousand.

- A. 3,384,556 B. 1,618,549 C. 875,352
D. 7,380,259 E. 1,935,086 F. 724,300

To round a number, keep as many figures at the left as you want and put zeros in the place of those you drop. If the first figure dropped is 5 or more, add 1 to the last figure you kept in your rounded number.

2. Round the populations given above to the nearest ten thousand; to the nearest hundred thousand; to the nearest million.

3. When eggs are \$.49 a doz., what will $\frac{1}{4}$ doz. cost? Does the grocer drop the $\$.00\frac{1}{4}$ or expect you to pay the whole cent? Would you say that your dealer rounds to the *nearest* cent?

4. Work Test 5A, page 21, with a partner. Check. Then work Section I, page 327.

5. Rounding numbers will help you to estimate reasonable answers in problem solving. Look up the word "approximate" in your dictionary. Then work Test 5B on page 21 with a partner. Section II, page 327, will give you additional practice.

Rounding Numbers

Test 5A (I, 327)

1. Round each number to the nearest—

Ten	183	169	225	466	719
Hundred	822	765	939	646	2265
Thousand	84,532	53,189	197,500		
Million	76,528,612	7,489,115	89,600,000		

Round to the nearest **thousand** and add.

2. 617,498; 97,143; 84,652; 7,715; 39,490

3. 7,700; 31,250; 90,514; 78,235; 6,775

Round to the nearest **million**. Subtract.

4. 42,830,776 - 35,732,185

5. 327,169,554 - 18,342,100

Round to the nearest **hundred**. Multiply.

6. $9,344 \times 460$

7. $6,724 \times 538$

Round to the nearest **thousand**. Divide.

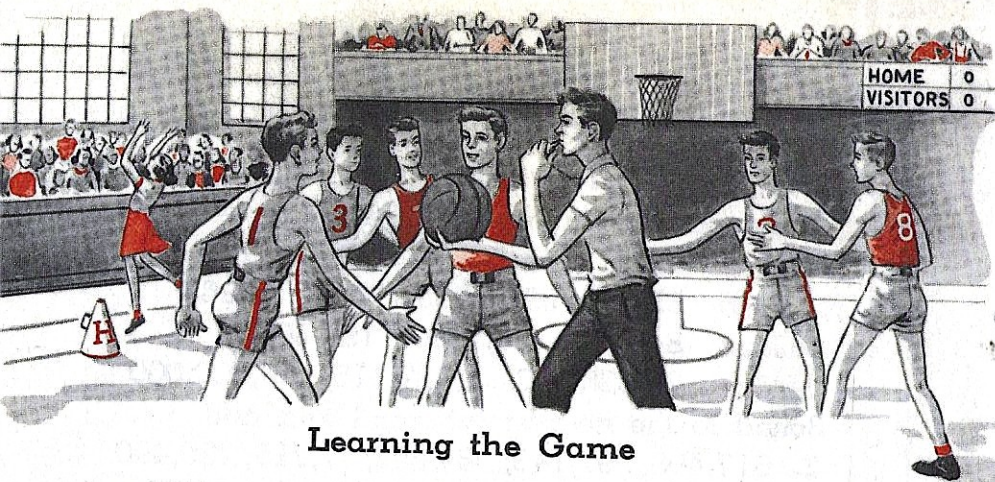
8. $767,538 \div 7,842$

9. $4,382,843 \div 9,009$

Test 5B (II, 327)

No pencils. Round each number as you think best. Name the best answer from those in parentheses. Check.

- | | |
|-------------------------|-----------------------|
| 1. $18 + 41 + 67 + 24$ | (130; 150; 170) |
| 2. $328 - 130$ | (190; 200; 450) |
| 3. $31 \times 69¢$ | (\$2; \$18; \$21) |
| 4. $\$15.60 \div 39$ | (\$4; 40¢; \$16) |
| 5. $2,786 + 319$ | (3000; 3100; 900) |
| 6. $8,347 - 4,778$ | (3,500; 3,600; 3,700) |
| 7. 123×28 | (2,400; 3,600; 1,500) |
| 8. $74,512 \div 25,398$ | (3; 300; 3,000) |

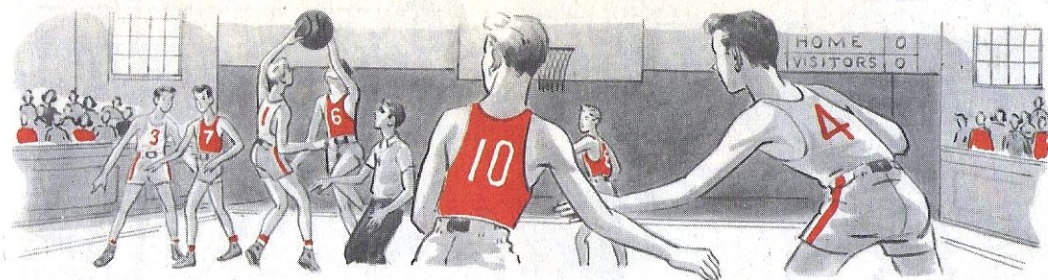


Learning the Game

1. A large basketball court is 90' by 50'. Find the area; the perimeter.
2. The "basket" or "cage" is 10 ft. above the floor. How far is it above the finger tips of a player who can reach 6'8"?
3. Work pages 338-340.
4. How far does a player advance in three steps if each step averages 3'2"?

Basketball is a game of great speed and skill. Players, sometimes called cagers, must know the rules and practice often to think and act quickly. Arithmetic is very much like basketball. You must know the rules and practice regularly to gain speed and accuracy.

In this arithmetic book, the first part of each unit teaches you the rules and gives you practice. Then comes the real game. At the end of each unit there is a test page called "The Tip-Off." Your goal is a certain number of right answers. Try to reach the goal.



The Tip-Off

Here is a chance to get 24 right answers. Mark papers at the end of each section.

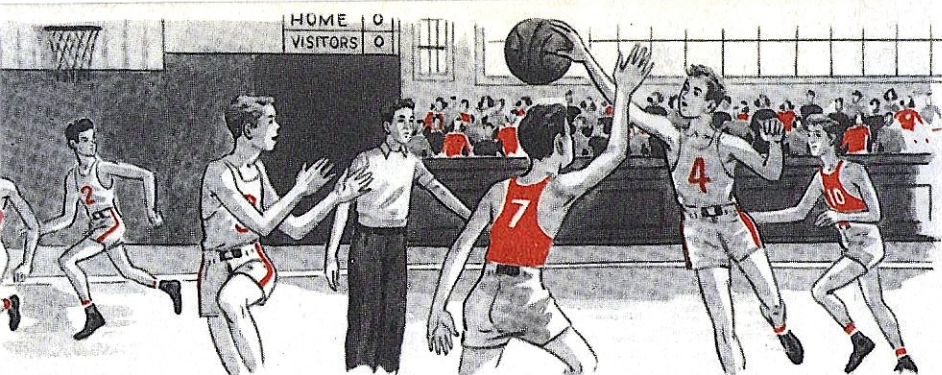
Section One

Add:	Subtract:	Multiply:	Divide:
1. $\begin{array}{r} 983 \\ 874 \\ 692 \\ 498 \\ 836 \\ 767 \\ 679 \\ 541 \end{array}$	2. $\begin{array}{r} 38,463 \\ 27,634 \end{array}$	5. $\begin{array}{r} 428 \\ 6 \end{array}$	8. $6 \overline{)1254}$
	3. $\begin{array}{r} 20,010 \\ 4,915 \end{array}$	6. $\begin{array}{r} 857 \\ 73 \end{array}$	9. $19 \overline{)6099}$
	4. $\begin{array}{r} 159,600 \\ 68,503 \end{array}$	7. $\begin{array}{r} 293 \\ 408 \end{array}$	10. $28 \overline{)16884}$
			11. $61 \overline{)3612}$
			12. $241 \overline{)18200}$

Section Two

13. Multiply by 1000—
 $\begin{array}{cccccc} .365 & 7.35 & 794 & .57 & .8 & 23 \end{array}$
14. Divide by 100—
 $\begin{array}{cccccc} 11 \text{ ft.} & \$45 & \$0.05 & 16000 \text{ mi.} & 5280 \text{ ft.} & .66 \text{ gal.} \end{array}$

If you had 20 or more right answers, you are near your goal. Keep passing the ball on page 25. If you made more than four mistakes, the ball is in enemy territory. You must recover the ball to reach your goal. Page 24 will help.



Recovering the Ball

1. Work the even numbered exercises on pages 317, 320, 323, and 326. Work carefully and quickly. Find a partner to check your work. Work together and find the mistakes in exercises you missed.

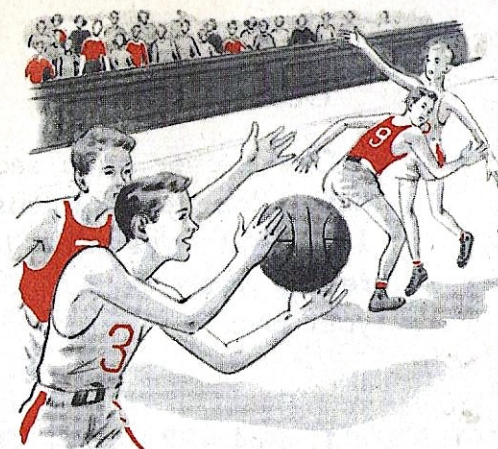
Add:			Subtract:		Multiply:	
2.	3.	4.	5. 4592	9. 42	13. 350	
			1493	69	20	
9	8	3				
6	9	2	6. 8205	10. 80	14. 304	
8	7	4	7538	78	507	
4	9	8				
7	6	7	7. 5002	11. 209	15. 829	
5	4	1	995	6	992	
6	7	9				
			8. 1441	12. 164	16. 200	
			633	205	70	

17. $60 \div 19$	22. $168 \div 28$	27. $361 \div 61$
18. $245 \div 83$	23. $182 \div 24$	28. $112 \div 27$
19. $64 \div 17$	24. $65 \div 23$	29. $96 \div 31$
20. $231 \div 76$	25. $265 \div 88$	30. $239 \div 79$
21. $168 \div 44$	26. $470 \div 94$	31. $215 \div 67$

Now work page 26.

Passing the Ball

Keep the ball moving toward your goal! Work all the problems on this page. Then help a classmate who is now working page 24, so that he, too, will get this practice.



1. Mr. Hill sold 7 bbl. of apples for \$48.65. How much was this per barrel?

2. One barrel of the apples weighed 147 lb. At this rate, what was the weight of 7 bbl.?

3. Mr. Day drove 346 mi. and Mr. Lane drove 97 mi. farther than Mr. Day. How far did Mr. Lane drive?

4. Mr. Hale is making a trip of 1,157 mi. He has gone 433 mi. How much farther does he have to go?

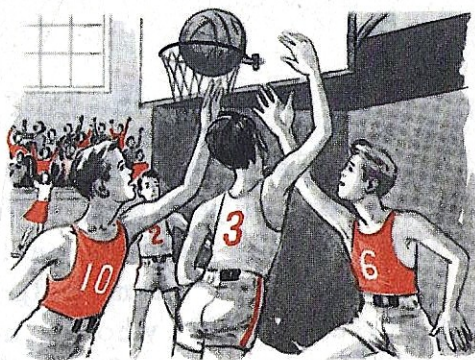
5. Mr. Best divided his property equally among his 13 children. Each of these received \$3926. What was the amount of his property?

6. Mr. Dale travels 16,353 mi. in making 237 round trips between Salem and Trinity. How far apart are the two cities?

7. A certain type plane carries a fuel capacity of 5,440 gal. A certain automobile has a fuel capacity of 16 gal. How many times as much fuel does the plane carry as does the automobile?

Goal for Unit One

Check after each section. You need at least 11 right answers to reach your goal. Do your best.



Section One

1. $864 + 32 + 400 + 637 + 1281 + 19$
2. $70310 - 29506$
3. $90028 - 72135$
4. 703×93
5. 10034×404
6. $61908 \div 84$
7. $27606 \div 68$

Section Two

8. The total weight of first-class mail carried on 10 trips by a plane was 7,485 lb. What was the average weight in pounds of first-class mail carried by this plane on a single trip?
9. At \$.065 a pound, what will 100 lb. of sugar cost?
10. It has been estimated that a player often runs about $2\frac{1}{2}$ mi. in playing a single game of basketball. Change this measure to feet.
11. What is the area in square feet of a garden plot that is 40 ft. long and 25 ft. wide?
12. What would it cost to fence the garden above if wire fencing costs 8¢ a foot?



Unit Two

Using Fractions

1. Eight boys and girls planned a picnic. They found that the total expense would be \$10.40. If each paid $\frac{1}{8}$ of the expense, how much did each pay?
2. They used $\frac{2}{5}$ of the money collected for food. How much was spent for food?
3. Three-fifths of the money collected was spent for bus fare for the group. What was the fare per person?
4. During the day Tom played 10 tennis matches and won 8 of them. What part of all the matches did he win?
5. After supper 6 sandwiches were left. If this was $\frac{3}{16}$ of all that were brought, how many sandwiches did they bring?

Meanings of Common Fractions

A fraction means a part of something, as $\frac{1}{2}$.

The numerator and denominator are called the terms of a common fraction.

The denominator, or the number below the line, shows the number of equal parts into which the whole has been divided.

The numerator, or the number above the line, shows how many parts are in the fraction.

In the fraction $\frac{1}{2}$, the denominator 2 shows that the whole has been divided into 2 equal parts. The numerator 1 shows that the fraction contains 1 of the equal parts.

A common fraction is an expression of division, as—

$$4 \overline{)5} = \frac{5}{4} = 1\frac{1}{4}$$

A common fraction may express a remainder, as—

$$4 \overline{)5} = 1\frac{1}{4}$$

A common fraction is an expression of a ratio, as—

Tom won 4 games out of 6, or $\frac{4}{6}$, which is $\frac{2}{3}$, or the ratio of 2:3.

Find the ratio of—

- | | | | |
|----------|-------|-------|--------|
| 1. 25:70 | 32:40 | 56:80 | 36:144 |
| 2. 24:72 | 54:81 | 27:90 | 48:240 |
| 3. 60:12 | 21:15 | 52:13 | 45:15 |
| 4. 32:24 | 50:5 | 72:18 | 36:4 |

Changing the Form of Fractions

Both terms of a fraction may be multiplied or divided by the same number without changing the value of the fraction.

1. Fill in the missing numerators:

$$\frac{10}{16} = \frac{?}{8} \quad \frac{21}{36} = \frac{?}{12} \quad \frac{20}{25} = \frac{?}{5} \quad \frac{15}{18} = \frac{?}{6} \quad \frac{14}{20} = \frac{?}{10}$$

2. Reduce each fraction to lowest terms, as $\frac{10}{24} = \frac{5}{12}$.

$$\frac{6}{8} \quad \frac{15}{20} \quad \frac{3}{6} \quad 1\frac{5}{10} \quad 2\frac{6}{15} \quad 8\frac{15}{24}$$

3. Change each improper fraction to a mixed number, as $\frac{50}{12} = 4\frac{2}{12} = 4\frac{1}{6}$.

$$\frac{11}{4} \quad \frac{9}{2} \quad \frac{28}{3} \quad \frac{12}{5} \quad \frac{18}{4} \quad \frac{36}{8}$$

4. Change each mixed number to an improper fraction, as $3\frac{1}{4} = \frac{13}{4}$.

$$2\frac{1}{2} \quad 3\frac{3}{4} \quad 8\frac{1}{2} \quad 6\frac{1}{4} \quad 1\frac{7}{8} \quad 6\frac{2}{3}$$

Work Test 6A. If you make mistakes, work pages 328, I and II, and 329, I and II.

Test 6A (I and II, 328; I and II, 329)

1. Reduce each fraction to lowest terms.

$$\frac{3}{15} \quad \frac{12}{16} \quad \frac{18}{24} \quad 7\frac{3}{9} \quad 4\frac{2}{4} \quad 5\frac{8}{16}$$

2. Change to improper fractions.

$$7\frac{1}{2} \quad 6\frac{3}{4} \quad 3\frac{1}{3} \quad 16\frac{2}{3} \quad 5\frac{1}{4} \quad 2\frac{3}{8}$$

3. Change to mixed numbers.

$$\frac{15}{8} \quad \frac{32}{5} \quad \frac{25}{6} \quad \frac{14}{3} \quad \frac{18}{4} \quad \frac{46}{8}$$

4. Supply the missing numerators.

$$\frac{3}{4} = \frac{?}{16} \quad \frac{5}{8} = \frac{?}{24} \quad \frac{1}{3} = \frac{?}{6} \quad \frac{2}{5} = \frac{?}{20}$$

Finding the Least Common Denominator

The least common denominator is the smallest denominator that will contain all the given denominators evenly.

The fractions $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{3}$ could be changed to the common denominator 48 because the given denominators 6, 8, and 3 are contained evenly in 48. But 48 is not the smallest number that will contain the given denominators evenly. The denominator 24 is the smallest, or least common denominator.

Work the following test. If you make mistakes, do the practice given on page 328, III.

Test 7A (III, 328)

There are three numbers after each set of fractions. Which of these numbers is the least common denominator (L.C.D.)?

1. $\frac{1}{4}$, $\frac{2}{3}$, $\frac{1}{4}$ (6, 12, 24) 3. $\frac{5}{6}$, $\frac{2}{3}$, $\frac{1}{4}$ (12, 18, 24)
2. $\frac{3}{5}$, $\frac{1}{2}$, $\frac{1}{4}$ (8, 10, 20) 4. $\frac{3}{8}$, $\frac{3}{4}$, $\frac{2}{3}$ (12, 24, 32)

Find the L.C.D. of each set of fractions.

5. $\frac{5}{8}$, $\frac{1}{3}$, $\frac{1}{2}$ 9. $\frac{1}{6}$, $\frac{1}{4}$, $\frac{2}{3}$ 13. $\frac{3}{5}$, $\frac{2}{3}$, $\frac{1}{4}$
6. $\frac{7}{12}$, $\frac{2}{3}$, $\frac{1}{4}$ 10. $\frac{9}{16}$, $\frac{7}{8}$, $\frac{1}{5}$ 14. $\frac{11}{24}$, $\frac{3}{5}$, $\frac{5}{6}$
7. $\frac{3}{7}$, $\frac{1}{2}$, $\frac{3}{4}$ 11. $\frac{8}{15}$, $\frac{3}{5}$, $\frac{1}{3}$ 15. $\frac{7}{15}$, $\frac{2}{7}$, $\frac{2}{3}$
8. $\frac{15}{32}$, $\frac{5}{8}$, $\frac{5}{16}$ 12. $\frac{2}{5}$, $\frac{1}{8}$, $\frac{1}{2}$ 16. $\frac{2}{3}$, $\frac{5}{12}$, $\frac{3}{5}$

Addition of Fractions and Mixed Numbers

Fractions having the same denominator are called like fractions.

To add like fractions, find the sum of the numerators. The denominator remains the same.

$$\frac{1}{8} + \frac{5}{8} + \frac{7}{8} = \frac{13}{8} = 1\frac{5}{8}$$

1. Add the like fractions and mixed numbers in Test 8A, page 32, with a partner. Check papers. If you make mistakes adding the mixed numbers, study the addition at the right.

$$\begin{array}{r} 5\frac{11}{12} \\ 2\frac{7}{12} \\ \hline 7\frac{18}{12} = 8\frac{6}{12} = 8\frac{1}{2} \end{array}$$

To add unlike fractions, change to the least common denominator and add.

$$\begin{array}{r} \frac{7}{24} = \frac{7}{24} \\ \frac{1}{3} = \frac{8}{24} \\ \hline \frac{15}{24} = \frac{5}{8} \end{array} \qquad \begin{array}{r} 6\frac{1}{8} = 6\frac{3}{24} \\ 4\frac{5}{6} = 4\frac{20}{24} \\ \hline 10\frac{23}{24} \end{array}$$

2. Work Test 8B, page 32, with a partner. If you make mistakes, practice on page 330.

3. Write each of the following in the form in which you would leave them if they were answers to problems.

$$\frac{11}{4} \quad \frac{4}{8} \quad 9\frac{5}{10} \quad \frac{15}{20} \quad \frac{21}{15} \quad 45\frac{6}{9}$$

Addition of Fractions and Mixed Numbers

Test 8A

Find the sums:

	a	b	c	d	e	f	g
1.	$\frac{1}{4}$	$\frac{1}{12}$	$\frac{3}{4}$	$\frac{7}{10}$	$1\frac{1}{6}$	$3\frac{1}{3}$	$2\frac{17}{24}$
	$\frac{1}{4}$	$\frac{7}{12}$	$\frac{3}{4}$	$\frac{5}{10}$	$2\frac{1}{6}$	$1\frac{1}{3}$	$4\frac{5}{24}$
2.	$\frac{3}{8}$	$\frac{11}{16}$	$\frac{7}{8}$	$\frac{4}{15}$	$4\frac{3}{5}$	$4\frac{1}{6}$	$8\frac{5}{9}$
	$\frac{1}{8}$	$\frac{15}{16}$	$\frac{5}{8}$	$\frac{7}{15}$	$7\frac{4}{5}$	$4\frac{5}{6}$	$2\frac{1}{9}$
3.	$\frac{1}{6}$	$\frac{5}{12}$	$\frac{7}{16}$	$\frac{5}{9}$	$6\frac{3}{5}$	$6\frac{1}{8}$	$7\frac{1}{12}$
	$\frac{5}{6}$	$\frac{7}{12}$	$\frac{9}{16}$	$\frac{8}{9}$	$1\frac{2}{5}$	$2\frac{7}{8}$	$5\frac{7}{12}$
	$\frac{1}{6}$	$\frac{11}{12}$	$\frac{15}{16}$	$\frac{2}{9}$	$4\frac{4}{5}$	$6\frac{5}{8}$	$8\frac{5}{12}$

Test 8B (330)

Find the sums:

	a	b	c	d	e	f	g
1.	$\frac{5}{16}$	$\frac{1}{6}$	$\frac{5}{6}$	$\frac{1}{2}$	$4\frac{1}{5}$	$1\frac{1}{2}$	$3\frac{1}{3}$
	$\frac{7}{16}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{3}$	$2\frac{2}{5}$	$2\frac{1}{4}$	$7\frac{1}{2}$
2.	$\frac{2}{3}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{3}{5}$	$6\frac{5}{12}$	$3\frac{4}{15}$	$6\frac{1}{4}$
	$\frac{3}{4}$	$\frac{4}{9}$	$\frac{5}{8}$	$\frac{1}{4}$	$2\frac{2}{3}$	$5\frac{1}{3}$	$5\frac{3}{16}$
3.	$\frac{3}{8}$	$\frac{5}{12}$	$\frac{3}{4}$	$\frac{5}{16}$	$6\frac{3}{10}$	$6\frac{3}{4}$	$7\frac{1}{2}$
	$\frac{2}{8}$	$\frac{1}{3}$	$\frac{5}{16}$	$\frac{3}{4}$	$1\frac{2}{10}$	$7\frac{1}{2}$	$1\frac{7}{8}$
	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{7}{8}$	$\frac{1}{3}$	$4\frac{3}{10}$	$4\frac{7}{8}$	$1\frac{2}{3}$



Sewing Problems

1. Ann's skirt measures $22\frac{7}{8}$ in. when finished. If she wishes to allow $2\frac{1}{4}$ in. for a hem, how long must she cut the material for her skirt?

2. Mary is making a towel. She wants it to be 24 in. long when finished. How long must she cut her piece of goods if she needs $1\frac{5}{8}$ in. for each hem? Draw the piece of goods, showing hems and measurements.

3. Ellen had a piece of ribbon. She used $\frac{1}{4}$ of it for a belt, $\frac{3}{8}$ for a bow, and $\frac{3}{8}$ for a purse. How much was left?

4. Jane sewed a piece of lace $\frac{3}{16}$ in. wide to the edge of a ruffle that was $\frac{5}{8}$ in. wide. The ruffle was then how wide?

5. The finished sleeve of Ann's blouse is $19\frac{5}{16}$ in. long. How long must she cut the material for her coat sleeve if she wants it $\frac{7}{8}$ in. longer than her blouse? Allow $1\frac{3}{4}$ in. for the hem on the coat sleeve.

Sawing Problems

1. Bill cut $\frac{1}{3}$ ft. from a board that was $\frac{3}{4}$ ft. long. How long was the piece that was left?

$$\frac{3}{4} = \frac{9}{12}$$

$$\frac{1}{3} = \frac{4}{12}$$

$$\frac{5}{12}$$

To subtract fractions, change to like denominators and find the difference between the numerators.

2. How long would a $\frac{5}{6}$ ft. board be if $\frac{1}{4}$ ft. were cut from it?

3. Jack cut $2\frac{3}{4}$ ft. from a piece of wood $12\frac{5}{12}$ ft. long. How long was the piece that was left? Explain:

$$12\frac{5}{12} = 12\frac{5}{12} = 11\frac{17}{12}$$

$$\underline{2\frac{3}{4}} \quad \underline{2\frac{9}{12}} \quad \underline{2\frac{9}{12}}$$

$$9\frac{8}{12} = 9\frac{2}{3}$$

4. Bob cut a shelf $5\frac{1}{12}$ ft. long. He found that he had cut it $\frac{1}{4}$ ft. too long. How long should it have been?

5. Tom found that one board measured $14\frac{1}{3}$ ft. and another measured $13\frac{1}{12}$ ft. How much longer was the first board?

6. Work Test 9A, page 35, with a partner. You will find practice on page 331, if you need it. Then try to get a perfect score for Test 9B, page 35.

Subtraction of Fractions and Mixed Numbers

Test 9A (331)

Subtract:

- | | a | b | c | d | e | f |
|----|-------------------------------------|----------------------------------|--|----------------------------------|----------------------------------|----------------------------------|
| 1. | $\frac{7}{8}$
$\frac{1}{8}$ | $\frac{5}{6}$
$\frac{1}{3}$ | $\frac{2}{3}$
$\frac{1}{4}$ | $\frac{1}{2}$
$\frac{1}{6}$ | $\frac{9}{16}$
$\frac{1}{4}$ | $\frac{5}{6}$
$\frac{2}{5}$ |
| 2. | $6\frac{2}{3}$
$1\frac{1}{3}$ | $1\frac{3}{4}$
$\frac{1}{4}$ | $7\frac{1}{2}$
$3\frac{1}{2}$ | $8\frac{3}{4}$
$8\frac{1}{2}$ | $6\frac{2}{3}$
$1\frac{1}{4}$ | $7\frac{4}{5}$
$2\frac{1}{6}$ |
| 3. | $6\frac{1}{4}$
$2\frac{1}{2}$ | $8\frac{1}{3}$
$2\frac{5}{6}$ | $7\frac{3}{4}$
$2\frac{5}{6}$ | $6\frac{1}{4}$
$2\frac{3}{4}$ | $8\frac{1}{4}$
$7\frac{1}{2}$ | $3\frac{1}{3}$
$\frac{3}{4}$ |
| 4. | $8\frac{1}{3}$ from $12\frac{1}{2}$ | | $124\frac{1}{2}$ from $302\frac{1}{4}$ | | | |
| 5. | $3\frac{3}{4}$ from $7\frac{1}{6}$ | | $840\frac{5}{6}$ from $923\frac{5}{8}$ | | | |

Test 9B

Subtract:

- | | a | b | c | d | e | f |
|----|-------------------------------------|----------------------------------|--|----------------------------------|----------------------------------|----------------------------------|
| 1. | $\frac{3}{4}$
$\frac{1}{4}$ | $\frac{2}{3}$
$\frac{1}{6}$ | $\frac{7}{8}$
$\frac{1}{3}$ | $\frac{1}{2}$
$\frac{1}{3}$ | $\frac{3}{4}$
$\frac{5}{16}$ | $\frac{3}{5}$
$\frac{1}{6}$ |
| 2. | $6\frac{3}{4}$
$2\frac{1}{4}$ | $2\frac{2}{3}$
$\frac{1}{3}$ | $5\frac{1}{4}$
$2\frac{1}{4}$ | $7\frac{5}{6}$
$7\frac{1}{6}$ | $8\frac{1}{3}$
$2\frac{1}{4}$ | $5\frac{3}{4}$
$2\frac{2}{5}$ |
| 3. | $8\frac{1}{3}$
$2\frac{2}{3}$ | $7\frac{1}{2}$
$2\frac{3}{4}$ | $9\frac{1}{6}$
$2\frac{2}{3}$ | $5\frac{1}{3}$
$2\frac{5}{8}$ | $8\frac{1}{3}$
$7\frac{5}{6}$ | $6\frac{1}{4}$
$\frac{2}{3}$ |
| 4. | $6\frac{1}{4}$ from $16\frac{2}{3}$ | | $221\frac{2}{3}$ from $418\frac{1}{2}$ | | | |
| 5. | $7\frac{1}{2}$ from $8\frac{1}{3}$ | | $638\frac{7}{8}$ from $833\frac{1}{3}$ | | | |



Fractions in Cooking

1. Mary found she did not have much butter and decided to make only $\frac{2}{3}$ of her recipe for cookies. If the recipe calls for $\frac{3}{4}$ cup of butter,

how much will she use?

To multiply a fraction by a fraction, multiply the numerators together and the denominators together.

Write the product in lowest terms, or change to a mixed number if it is an improper fraction. Explain:

$$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$$

Sometimes it is simpler to use cancellation.

Cancellation is a form of division. To cancel, divide a numerator and a denominator by the same number.

$$\frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} = \frac{1}{2}$$

2. How much butter would Mary use if the recipe called for $\frac{7}{8}$ cup of butter and she decided to make $\frac{1}{2}$ the recipe?

3. Tom was making candy. The recipe called for $2\frac{3}{4}$ cups of sugar. How much did he use to make $1\frac{1}{2}$ times the recipe?

To multiply a mixed number by a mixed number, change each to an improper fraction and multiply, as—

$$2\frac{3}{4} \times 1\frac{1}{2} = \frac{11}{4} \times \frac{3}{2} = \frac{33}{8} = 4\frac{1}{8}$$

4. How much sugar would Tom use in making $1\frac{1}{3}$ times the recipe? (Cancel before multiplying.)

5. Bob used the following recipe to make fudge for a Scout Troop sale. How much of each ingredient must he use to make $3\frac{1}{2}$ times the recipe?

Chocolate Fudge

$1\frac{3}{4}$ oz. chocolate	$1\frac{1}{2}$ tablespoons butter
2 cups sugar	2 tablespoons sirup
$\frac{1}{8}$ teaspoon salt	1 teaspoon vanilla
$\frac{3}{4}$ cup rich milk	$\frac{1}{3}$ cup broken pecans

6. A recipe makes 40 caramels. Bill made $2\frac{3}{4}$ times the recipe. How many caramels did he make? Explain A and B.

A. $40 \times 2\frac{3}{4} =$

$$\frac{\overset{10}{\cancel{40}}}{1} \times \frac{\overset{11}{\cancel{11}}}{\underset{1}{\cancel{4}}} = 110$$

B.

$$\begin{array}{r} 40 \\ \times 2\frac{3}{4} \\ \hline 4 \overline{)120} \\ \underline{80} \\ 110 \end{array}$$

7. Work Test 10A, page 38, with a partner. You will find special practice on page 332, I.

8. Race with your partner and do Test 10B, page 38. Try to be first to finish and get a perfect score.

Multiplication of Fractions and Mixed Numbers

Test 10A (I, 332)

Find the products:

- | a | b | c | d |
|---------------------------------------|-------------------------------------|------------------------------------|------------------------------------|
| 1. $\frac{3}{4}$ of 8 | $\frac{5}{6} \times 24$ | $18 \times \frac{2}{3}$ | $\frac{3}{8} \times 324$ |
| 2. $\frac{6}{5}$ of 15 | $\frac{3}{2} \times 16$ | $3\frac{3}{4} \times 12$ | $24 \times 8\frac{1}{3}$ |
| 3. $\frac{1}{3}$ of $\frac{3}{4}$ | $\frac{7}{8} \times \frac{4}{5}$ | $\frac{2}{3} \times \frac{5}{8}$ | $\frac{4}{5} \times \frac{2}{3}$ |
| 4. $\frac{3}{5}$ of $8\frac{1}{3}$ | $\frac{3}{4} \times 42$ | $\frac{5}{8} \times 2\frac{2}{3}$ | $16\frac{2}{3} \times \frac{1}{2}$ |
| 5. $8\frac{1}{4} \times 6\frac{2}{3}$ | $16\frac{1}{2} \times 5\frac{1}{3}$ | $3\frac{3}{4} \times 6\frac{2}{5}$ | $9\frac{1}{3} \times 1\frac{5}{7}$ |
-
- | | | | |
|--|--|--|--|
| 6.
$\begin{array}{r} 342 \\ \times 16\frac{1}{2} \\ \hline \end{array}$ | 7.
$\begin{array}{r} 762 \\ \times 36\frac{2}{3} \\ \hline \end{array}$ | 8.
$\begin{array}{r} 584\frac{3}{4} \\ \times 24 \\ \hline \end{array}$ | 9.
$\begin{array}{r} 112\frac{1}{2} \\ \times 16 \\ \hline \end{array}$ |
|--|--|--|--|

Test 10B

- | a | b | c | d |
|---------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| 1. $\frac{2}{3}$ of 9 | $\frac{5}{8} \times 32$ | $24 \times \frac{3}{4}$ | $\frac{5}{8} \times 656$ |
| 2. $\frac{8}{3}$ of 24 | $\frac{5}{4} \times 20$ | $6\frac{2}{3} \times 15$ | $36 \times 3\frac{3}{4}$ |
| 3. $\frac{1}{4}$ of $\frac{4}{5}$ | $\frac{5}{6} \times \frac{2}{3}$ | $\frac{3}{4} \times \frac{5}{9}$ | $\frac{3}{8} \times \frac{1}{4}$ |
| 4. $\frac{3}{4}$ of $6\frac{2}{3}$ | $\frac{5}{6} \times 27$ | $\frac{7}{8} \times 5\frac{1}{3}$ | $12\frac{1}{2} \times \frac{1}{4}$ |
| 5. $6\frac{1}{4} \times 3\frac{1}{4}$ | $13\frac{1}{2} \times 3\frac{1}{3}$ | $8\frac{1}{3} \times 3\frac{3}{4}$ | $1\frac{3}{7} \times 17\frac{1}{2}$ |
-
- | | | | |
|--|--|--|--|
| 6.
$\begin{array}{r} 834 \\ \times 24\frac{2}{3} \\ \hline \end{array}$ | 7.
$\begin{array}{r} 628 \\ \times 32\frac{3}{4} \\ \hline \end{array}$ | 8.
$\begin{array}{r} 864\frac{3}{5} \\ \times 45 \\ \hline \end{array}$ | 9.
$\begin{array}{r} 116\frac{2}{3} \\ \times 15 \\ \hline \end{array}$ |
|--|--|--|--|

Division of Common Fractions

1. Jack had a piece of string measuring $\frac{3}{4}$ yd. He cut it into two equal parts. How long was each part?

$\frac{3}{4} \div \frac{2}{1}$ is the same as $\frac{1}{2}$ of $\frac{3}{4}$, because when anything is divided into 2 equal parts, one part is $\frac{1}{2}$ of the whole.

$$\text{Then } \frac{3}{4} \div 2 = \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$$

To divide a fraction by a whole number—

Write the whole number as an improper fraction by giving it a denominator of 1.

Invert the terms of the divisor, and multiply.

2. How long would each piece of string be if Jack divided a piece $\frac{5}{6}$ yd. long into 4 equal parts?

3. How many pieces of cloth $\frac{2}{9}$ yd. long can Mary cut from a piece of cloth $\frac{2}{3}$ yd. long?

$$\frac{2}{3} \div \frac{2}{9} = \frac{6}{9} \div \frac{2}{9} = 6 \text{ ninths} \div 2 \text{ ninths} = 3$$

Here is a short way to find the answer—

$$\frac{2}{3} \div \frac{2}{9} = \frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{3}{\cancel{9}}}{\underset{1}{\cancel{2}}} = 3$$

$\frac{9}{2}$ is the divisor $\frac{2}{9}$ inverted.

To divide any number by a fraction, invert the divisor and multiply. Cancel when you can.

Using Mixed Numbers in Division

1. Jane has $10\frac{1}{2}$ yd. of ribbon. She wants it cut into pieces $1\frac{1}{6}$ yd. long. How many pieces will there be?

To divide a mixed number by a mixed number—
Change to improper fractions.

Invert the terms of the divisor.

Cancel if you can. Then multiply, as—

$$10\frac{1}{2} \div 1\frac{1}{6} = \frac{21}{2} \div \frac{7}{6} = \frac{21}{2} \times \frac{6}{7} = 9$$

2. How many pieces would there be if $6\frac{1}{4}$ yd. of ribbon were cut into pieces $1\frac{1}{4}$ yd. long?

3. How many pieces would you have if you sawed a board $10\frac{2}{3}$ ft. long into pieces $2\frac{2}{3}$ ft. long?

4. How long would each piece be if a board $10\frac{1}{2}$ ft. long is cut into 7 equal parts? Explain:

$$10\frac{1}{2} \div 7 = \frac{21}{2} \div \frac{7}{1} = \frac{21}{2} \times \frac{1}{7} = \frac{3}{2} = 1\frac{1}{2}$$

5. Cut a 15-ft. board into pieces $1\frac{1}{2}$ ft. long. How many pieces will there be?

6. How many boxes containing $\frac{3}{4}$ lb. of candy can you fill from a jar of candy containing 6 lb.?

7. Work Test 11A, page 41, with a partner. Do practice on page 332, II if you need it. Then try to work Test 11B, page 41, faster than your partner. To win you must get a perfect score.

Division of Fractions and Mixed Numbers

Test 11A (II, 332)

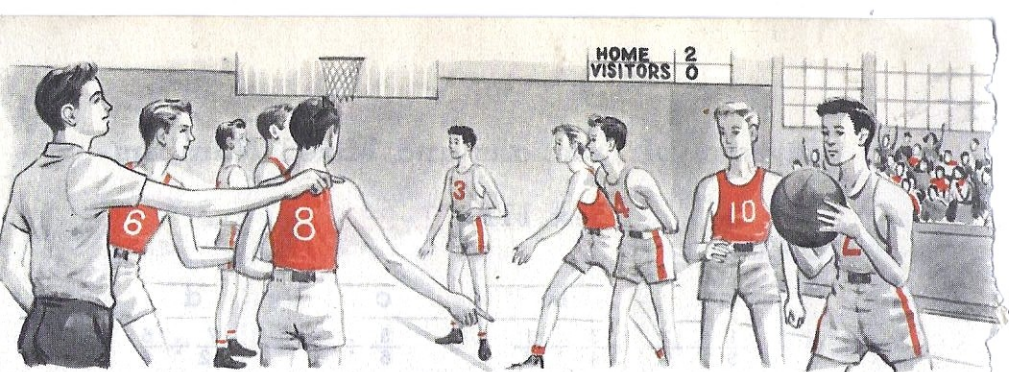
Divide:

- | | a | b | c | d |
|----|--|---------------------------------|------------------------------------|-------------------------------------|
| 1. | $\frac{1}{6} \div \frac{1}{2}$ | $\frac{3}{4} \div \frac{1}{3}$ | $\frac{5}{6} \div \frac{2}{3}$ | $\frac{7}{12} \div \frac{5}{6}$ |
| 2. | $6 \div \frac{1}{3}$ | $8\frac{1}{3} \div \frac{1}{2}$ | $\frac{5}{12} \div 8\frac{1}{3}$ | $\frac{9}{16} \div 1\frac{7}{8}$ |
| 3. | $2\frac{1}{2} \div 2$ | $6\frac{3}{4} \div 3$ | $5 \div 1\frac{1}{4}$ | $16\frac{2}{3} \div 3\frac{1}{3}$ |
| 4. | $212\frac{1}{2} \div 5$ | $300 \div 33\frac{1}{3}$ | $146\frac{1}{4} \div 9\frac{3}{8}$ | $18\frac{3}{4} \div 112\frac{1}{2}$ |
| 5. | A loaf of bread that weighs $1\frac{1}{4}$ lb. costs 15 cents. How much is this per pound? | | | |
| 6. | Henry gave \$2.55 to his mother. This was $\frac{3}{8}$ of all his money. How much money did he have in all? | | | |

Test 11B

Divide:

- | | a | b | c | d |
|----|--|---------------------------------|-------------------------------------|------------------------------------|
| 1. | $\frac{1}{6} \div \frac{1}{3}$ | $\frac{2}{3} \div \frac{1}{2}$ | $\frac{5}{8} \div \frac{5}{6}$ | $\frac{9}{16} \div \frac{5}{8}$ |
| 2. | $5 \div \frac{1}{2}$ | $6\frac{2}{3} \div \frac{1}{3}$ | $\frac{9}{16} \div 6\frac{3}{4}$ | $\frac{7}{8} \div 1\frac{3}{5}$ |
| 3. | $8 \div \frac{4}{5}$ | $6\frac{1}{4} \div \frac{1}{4}$ | $9 \div 1\frac{1}{2}$ | $18\frac{3}{4} \div 3\frac{3}{4}$ |
| 4. | $286\frac{1}{2} \div 3$ | $500 \div 37\frac{1}{2}$ | $266\frac{2}{3} \div 16\frac{2}{3}$ | $11\frac{7}{8} \div 71\frac{1}{4}$ |
| 5. | A kite string broke so that $\frac{3}{5}$ of it flew away with the kite. What was left was 40 ft. long. How long was the string before it broke? | | | |
| 6. | Mr. Hunt is $3\frac{3}{4}$ times as old as Jack. Mr. Hunt is 30 yr. old. How old is Jack? | | | |



Free Throws

A basketball player meets a real test when he makes a free throw. While fellow players watch, he must remember the rules and have skill and confidence. This test is like a free throw. You have the ball! Think of the rules and do your best.

Check after each throw. A perfect score counts as a point for that throw.

First Throw: Add:

$$\begin{array}{ll} 1. 2\frac{2}{3} + 3\frac{1}{4} + 2\frac{5}{6} = & 2. 3\frac{7}{8} + 2\frac{5}{6} + 5\frac{1}{3} = \\ 3. 7\frac{2}{3} + 5\frac{3}{4} + \frac{5}{6} = & 4. 8\frac{2}{3} + 4\frac{1}{6} + 3\frac{1}{9} = \end{array}$$

Second Throw: Subtract:

$$\begin{array}{lll} 5. \frac{3}{4} - \frac{1}{6} = & 6. \frac{3}{4} - \frac{5}{12} = & 7. \frac{4}{5} - \frac{1}{4} = \\ 8. 8\frac{2}{3} - 6\frac{1}{2} = & 9. 6\frac{5}{9} - \frac{2}{3} = & 10. 17\frac{1}{8} - 11\frac{5}{12} = \end{array}$$

Third Throw: Multiply:

$$\begin{array}{lll} 11. \frac{4}{5} \times \frac{5}{8} = & 12. 3\frac{1}{5} \times 2 = & 13. 8 \times 3\frac{1}{4} = \\ 14. 8\frac{4}{5} \times 2\frac{3}{11} = & 15. 3\frac{1}{2} \times 4\frac{2}{3} = & 16. \frac{7}{8} \times \frac{4}{9} = \end{array}$$

Fourth Throw: Divide:

$$\begin{array}{lll} 17. 7 \div 1\frac{5}{16} = & 18. \frac{5}{16} \div \frac{7}{8} = & 19. 3\frac{1}{4} \div 2\frac{1}{2} = \\ 20. 12\frac{1}{2} \div \frac{1}{4} = & 21. 1\frac{1}{4} \div 4\frac{2}{3} = & 22. 8\frac{4}{5} \div 1\frac{1}{5} = \end{array}$$

Addition and Subtraction of Decimals

In adding decimals, keep decimal points under each other.

In whole numbers write a decimal point at the right of ones place.

1. $3.062 + 8.752 + 12 =$
2. $2.1 + 635 + 9.099 =$
3. $.407 + 350 + 26.103 =$
4. $2.055 + .003 + 1.816 =$
5. $.5 + 1.3 + 13 =$
6. $82 + 126 + .126 =$
7. Work Test 12A, page 44. If you make mistakes, do **333, I**.

In subtracting decimals, keep the decimal points under each other.

A decimal point should be written after a whole number. Add as many zeros after the whole number as there are decimal places in the other number.

8. Explain the following subtractions:

$$\begin{array}{r} \text{A. } 12 - 5.16 = \\ \begin{array}{r} 12.00 \\ - 5.16 \\ \hline 6.84 \end{array} \end{array}$$

$$\begin{array}{r} \text{B. } 29.57 - 14 = \\ \begin{array}{r} 29.57 \\ - 14.00 \\ \hline 15.57 \end{array} \end{array}$$

Subtract:

9. $600 - .003 =$
10. $84.02 - 63.46 =$
11. $15.001 - 7 =$
12. $.967 - .35 =$
13. $13.826 - 7.009 =$
14. $633.85 - .24 =$
15. Work Test 12B, page 44. If you make mistakes, do **333, II**.

Addition of Decimals

Test 12A (I, 333)

Find the sums:

1.	2.	3.	6.	7.	8.
$\begin{array}{r} 5.4 \\ 3.6 \\ \hline \end{array}$	$\begin{array}{r} 1.97 \\ .09 \\ \hline \end{array}$	$\begin{array}{r} 6.34 \\ 3.75 \\ \hline \end{array}$	$\begin{array}{r} 4.8 \\ .3 \\ .5 \\ \hline \end{array}$	$\begin{array}{r} 3.27 \\ .94 \\ 5.44 \\ \hline \end{array}$	$\begin{array}{r} .8 \\ .001 \\ 5.9 \\ \hline \end{array}$
4.	5.				
$\begin{array}{r} 256.125 \\ .009 \\ 5.300 \\ \hline \end{array}$	$\begin{array}{r} 1.37 \\ .181 \\ 4.5 \\ \hline \end{array}$	$\begin{array}{r} 5.5 \\ .8 \\ 9.9 \\ .5 \\ \hline \end{array}$	$\begin{array}{r} .86 \\ 7.73 \\ .06 \\ 18.81 \\ \hline \end{array}$	$\begin{array}{r} .654 \\ .8 \\ .103 \\ 39.1 \\ \hline \end{array}$	

9. $13.4 + 16.2 + 1.5 =$ 11. $.625 + .005 + 18.375 =$
 10. $.57 + .875 + 12.5 =$ 12. $75 + 18.75 + 11.396 =$

Subtraction of Decimals

Test 12B (II, 333)

Subtract:

- | | | | |
|---|---|---|---|
| 1. $\begin{array}{r} 8.3 \\ 1.8 \\ \hline \end{array}$ | 2. $\begin{array}{r} 56.2 \\ 29.0 \\ \hline \end{array}$ | 3. $\begin{array}{r} 72.91 \\ 8.36 \\ \hline \end{array}$ | 4. $\begin{array}{r} 147.13 \\ 83.38 \\ \hline \end{array}$ |
| 5. $\begin{array}{r} 2.5 \\ .9 \\ \hline \end{array}$ | 6. $\begin{array}{r} 9.18 \\ 2.35 \\ \hline \end{array}$ | 7. $\begin{array}{r} 1.836 \\ 1.258 \\ \hline \end{array}$ | 8. $\begin{array}{r} 28.002 \\ 7.094 \\ \hline \end{array}$ |
| 9. $\begin{array}{r} 4.0 \\ 2.4 \\ \hline \end{array}$ | 10. $\begin{array}{r} 7.2 \\ 1.45 \\ \hline \end{array}$ | 11. $\begin{array}{r} 39.45 \\ 1.6 \\ \hline \end{array}$ | 12. $\begin{array}{r} 4.5009 \\ 3.63 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 6.1843 \\ 2.0905 \\ \hline \end{array}$ | 14. $\begin{array}{r} 8.0000 \\ 4.0901 \\ \hline \end{array}$ | 15. $\begin{array}{r} 78.3 \\ 32.593 \\ \hline \end{array}$ | |
16. 7.843 from 12.96 17. 18.632 from 20
 18. 42.3 from 162.98 19. 17.28 from 31.416

Multiplication of Decimals

In multiplying decimals:

Multiply as in whole numbers.

Add the number of decimal places in the multiplicand to the number of places in the multiplier. Begin at the right of the product and point off as many decimal places as there are in the multiplicand and multiplier together. Explain:

A. $\begin{array}{r} 3.5 \\ \times 8.6 \\ \hline 210 \\ 280 \\ \hline 30.10 \end{array}$	B. $\begin{array}{r} 186 \\ \times .04 \\ \hline 7.44 \end{array}$	C. $\begin{array}{r} .006 \\ \times 8 \\ \hline .048 \end{array}$	D. $\begin{array}{r} .006 \\ \times .002 \\ \hline .000012 \end{array}$
--	--	---	---

Work the following test with a partner. Page 334, I, will give special practice if you need it.

Multiplication of Decimals

Test 13A (I, 334)

Copy. Write the decimal point correctly in each product.

- | | |
|--|--|
| 1. $1.6 \times 9 = 144$ | 2. $.24 \times .7 = 168$ |
| 3. $1.25 \times .07 = 875$ | 4. $71.31 \times .06 = 42786$ |
| 5. $.043 \times .9 = 387$ | 6. $.0016 \times 6 = 96$ |
| 7. $4.32 \times .28 = 12096$ | 8. $.018 \times .7 = 126$ |
| 9. $\begin{array}{r} 8.6 \\ \times 4 \\ \hline \end{array}$ | 10. $\begin{array}{r} 9.73 \\ \times .6 \\ \hline \end{array}$ |
| 11. $\begin{array}{r} 4.617 \\ \times 9 \\ \hline \end{array}$ | 12. $\begin{array}{r} 98.124 \\ \times .8 \\ \hline \end{array}$ |
| 13. $\begin{array}{r} 7.2 \\ \times .08 \\ \hline \end{array}$ | 14. $\begin{array}{r} 7.64 \\ \times .38 \\ \hline \end{array}$ |
| 15. $\begin{array}{r} 34.71 \\ \times 4.2 \\ \hline \end{array}$ | 16. $\begin{array}{r} 7.3822 \\ \times 76 \\ \hline \end{array}$ |

Gaining Strength in Problem Solving



No pencils, please!

1. Jerry had \$42. He spent $\frac{5}{6}$ of it for a bicycle. How much did the bicycle cost?

The fraction $\frac{5}{6}$ shows the ratio of the cost of the bicycle to the money Jerry had, or the whole:

Ratio $\times$ whole = part

$$\frac{5}{6} \text{ of } \$42 = \frac{5}{\cancel{6}^1} \times \$\cancel{42}^7 = \$35$$

2. How much would he have paid for the bicycle if it cost $\frac{2}{3}$ of his money?

3. Bill had 144 newspapers to sell. He sold $\frac{5}{8}$ of them. How many had he left?

4. Tom had 12 magazines left to sell. This was $\frac{2}{5}$ of all he had at first. How many did he have at first?

The fraction $\frac{2}{5}$ shows the ratio of the part (12) to the whole.

Part $\div$ ratio = whole

$$12 \div \frac{2}{5} = \frac{12}{\cancel{2}^1} \times \frac{5}{\cancel{2}^1} = 30$$

5. If 12 magazines were $\frac{6}{25}$ of what he had at first, how many would he have had at first?

6. Tom said the 48 rabbits were $\frac{3}{8}$ of all he raised last year. How many did he raise last year?

7. Grace spent $\frac{5}{8}$ of her money. She had \$9 left. How much did she have at first? Think: $\frac{8}{8} - \frac{5}{8} = \frac{3}{8}$. Then find the whole.

8. Fred had 15 fish left. He said he had sold $\frac{2}{5}$ of what he had at first. How many fish did he have at first?

9. Jack had 45 chickens. He sold 20 of them. What part of them did he sell? To compare one number with another we find the ratio. Ratio is a form of division.

$$\frac{\text{Part}}{\text{Whole}} = \text{ratio} \quad \frac{20}{45} = \frac{4}{9}$$

10. If Jack had sold 15 chickens, what part of his whole flock would he have sold? 12 chickens? 24 chickens? 42 chickens?

11. A $3\frac{1}{2}$ -lb. chicken loses 9 oz. in weight when cleaned. What fraction of the weight is lost in cleaning? (Change to like units.)

12. A 10-ft. board is what part of a 15-ft. board? Of a 12-ft. board? Of an 18-ft. board?

13. Tom earns \$15 a week. If he works only 3 days instead of the required 5 days, what will his pay be?

14. Mr. Brown paid $\frac{5}{6}$ of a debt of \$54. How much did he pay?

Division of Decimals

If the divisor is a whole number, place the decimal point in the quotient directly above the decimal point in the dividend.

Study the first division. Divide.

$$\begin{array}{r} 2.43 \\ 8 \overline{)19.44} \end{array} \quad \begin{array}{r} 6 \overline{)0.0024} \end{array} \quad \begin{array}{r} 8 \overline{)9.6} \end{array} \quad \begin{array}{r} 9 \overline{)9.81} \end{array}$$

If the divisor is a decimal, make it a whole number by moving its decimal point as many places to the right as there are decimal places in the divisor.

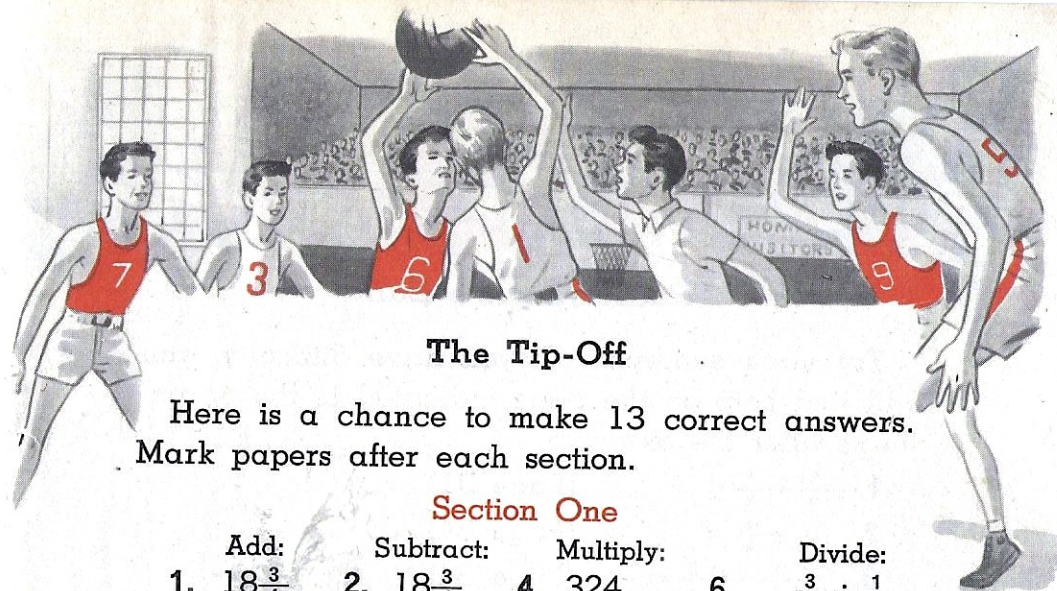
Then move the decimal point in the dividend as many places to the right as you did the decimal point in the divisor. Divide and point off the quotient, as—

$$\begin{array}{r} 811 \\ .08 \overline{)6.488} \end{array} \quad \begin{array}{r} 60. \\ 1.2 \overline{)72.0} \end{array} \quad \begin{array}{r} 2000. \\ .005 \overline{)10.000} \end{array}$$

Division of Decimals

Test 13B (II, 334)

1. $172.8 \div 1.2 =$
2. $29.19 \div .21 =$
3. $10.24 \div .32 =$
4. $.1525 \div .45 =$
5. $231 \div 3.3 =$
6. $800.88 \div .213 =$
7. $1.591 \div 4.3 =$
8. $13.3334 \div .409 =$
9. $83 \overline{)3.486}$
10. $.28 \overline{).2632}$
11. $7.3 \overline{)222.65}$
12. $35.2 \overline{)72.512}$
13. $.124 \overline{)6.6588}$
14. $70.4 \overline{)47.168}$
15. $5.4 \overline{)6.8202}$
16. $.271 \overline{)13658.4}$



The Tip-Off

Here is a chance to make 13 correct answers. Mark papers after each section.

Section One

- | Add: | Subtract: | Multiply: | Divide: |
|--------------------|--------------------|---------------------|--------------------------------------|
| 1. $18\frac{3}{4}$ | 2. $18\frac{3}{4}$ | 4. 324 | 6. $\frac{3}{4} \div \frac{1}{2}$ |
| $32\frac{1}{8}$ | $7\frac{2}{3}$ | $16\frac{2}{3}$ | 7. $\frac{8}{15} \div 2$ |
| $24\frac{5}{12}$ | | | |
| $51\frac{2}{3}$ | 3. $31\frac{3}{8}$ | 5. $637\frac{1}{2}$ | 8. $33\frac{1}{3} \div 1\frac{2}{3}$ |
| | $15\frac{9}{16}$ | 24 | |

Section Two

9. At $4\frac{1}{2}$ ¢ an hour, how much will the electricity cost if Jane irons $2\frac{2}{3}$ hr.?
 10. What will it cost to use an electric fan for $5\frac{1}{2}$ hr. at $\frac{1}{3}$ ¢ an hour?
 11. Find the cost of $2\frac{3}{4}$ lb. of butter at \$.52 a pound.
 12. Mrs. Allen paid \$75 for $9\frac{3}{8}$ yd. of stair carpet. What did one yard cost?
 13. Ellen had \$375 in the bank. She spent \$250 of it. What part did she spend?
- If your score was less than 13 right answers, work page 50. Otherwise, do page 51.



Recovering the Ball

Try each example. If you have difficulty, you will find help on the page indicated in the parenthesis after the example.

1. $\frac{3}{4} + \frac{1}{8} =$ (Page 31)
2. $\frac{2}{3} - \frac{1}{4} =$ (Page 34)
3. $12\frac{1}{2} - 6\frac{2}{3} =$ (Page 34)
4. $7\frac{1}{2} + 1\frac{2}{3} =$ (Page 31)
5. $19.2 - 3.37 =$ (Page 43)
6. $8.43 + 3.6 =$ (Page 43)
7. $6\frac{2}{3} \times 1\frac{1}{2} =$ (Page 36)
8. $6\frac{1}{4} \times 84 =$ (Page 37)
9. $3.28 \times 4.3 =$ (Page 45)
10. $16\frac{2}{3} \div \frac{5}{6} =$ (Page 40)
11. $\frac{9}{16} \div \frac{5}{8} =$ (Page 39)
12. $1.152 \div 7.2 =$ (Page 48)
13. $.0025 \div .005 =$ (Page 48)
14. $\frac{4}{5}$ of 395 = (Page 46, Prob. 1)
15. 36 is what part of 96? (Page 47, Prob. 11)
16. 72 is $\frac{4}{5}$ of what number? (Page 46, Prob. 4)
17. Have someone now working page 51 help you check your answers as you work on page 331.
18. Work Test 13A and Test 13B.

Passing the Ball

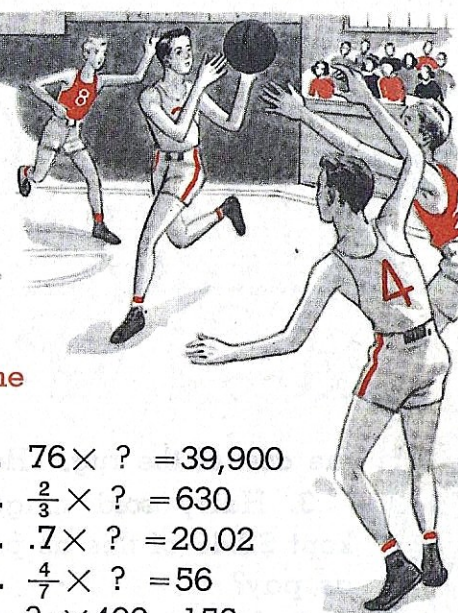
Try to get perfect scores on the following tests. Then help someone now working page 50.

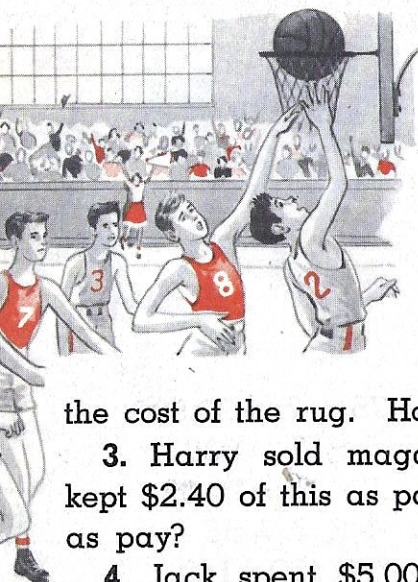
Test One

- Find the answers:
- | | |
|---------------------------------|------------------------------------|
| 1. $32 \times 468 = ?$ | 11. $76 \times ? = 39,900$ |
| 2. $\frac{3}{4} \times 768 = ?$ | 12. $\frac{2}{3} \times ? = 630$ |
| 3. $.8 \times 3,125 = ?$ | 13. $.7 \times ? = 20.02$ |
| 4. $\frac{5}{8} \times 824 = ?$ | 14. $\frac{4}{7} \times ? = 56$ |
| 5. $.25 \times 1600 = ?$ | 15. $? \times 400 = 150$ |
| 6. $? \times 500 = 125$ | 16. $.12\frac{1}{2} \times ? = 80$ |
| 7. $144 \div 3.6 = ?$ | 17. $275 \div ? = 110$ |
| 8. $24 \div \frac{2}{3} = ?$ | 18. $36 \div ? = 48$ |
| 9. $480 \div .4 = ?$ | 19. $72 \div ? = 9000$ |
| 10. $.384 \div \frac{3}{8} = ?$ | 20. $? \div \frac{4}{5} = 120$ |

Test Two

- | | |
|-----------------------------------|-------------------------------------|
| 1. $54 \times 963 = ?$ | 11. $64 \times ? = 56,000$ |
| 2. $\frac{7}{8} \times 840 = ?$ | 12. $\frac{3}{5} \times ? = 360$ |
| 3. $.6 \times 4,750 = ?$ | 13. $.9 \times ? = 14.04$ |
| 4. $\frac{3}{16} \times 48 = ?$ | 14. $\frac{5}{9} \times ? = 45$ |
| 5. $.15 \times 1800 = ?$ | 15. $.37\frac{1}{2} \times ? = 240$ |
| 6. $? \times 800 = 200$ | 16. $? \times 630 = 210$ |
| 7. $231 \div 3.3 = ?$ | 17. $875 \div ? = 2\frac{1}{3}$ |
| 8. $48 \div \frac{3}{4} = ?$ | 18. $72 \div ? = 108$ |
| 9. $540 \div .36 = ?$ | 19. $28 \div ? = 49$ |
| 10. $1.728 \div \frac{9}{16} = ?$ | 20. $? \div \frac{7}{12} = 216$ |





Goal for Unit Two

Nine right answers are your goal.

1. Two-thirds yard of linen costs 96¢. What is the cost of 1 yard?

2. A rug cost \$350. The sales tax was .02 of

the cost of the rug. How much was the sales tax?

3. Harry sold magazines totaling \$9.60. He kept \$2.40 of this as pay. What part did he keep as pay?

4. Jack spent \$5.00 for a camera. This was .4 of his money. How much money did he have before he bought the camera?

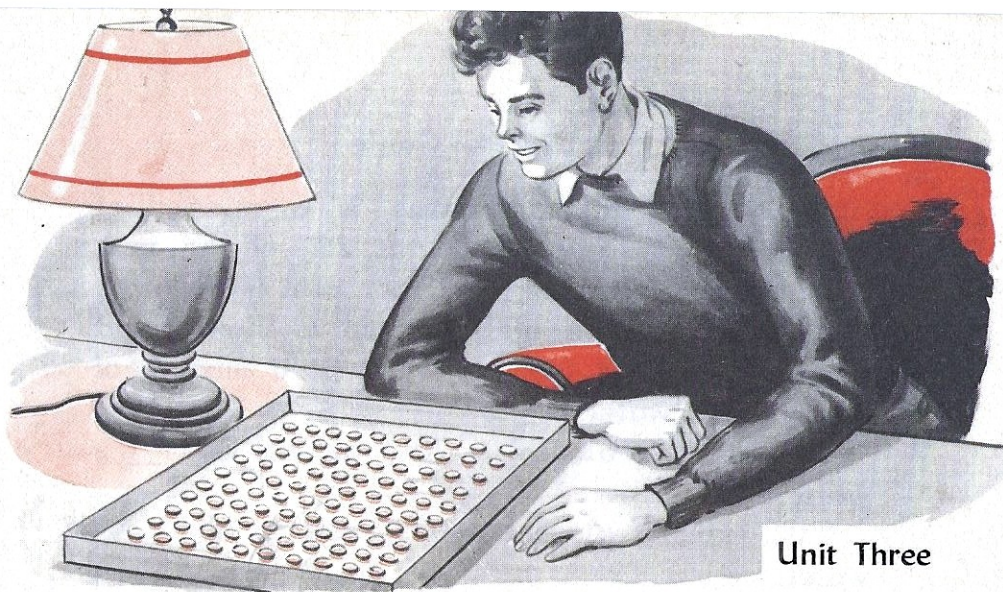
5. A suit marked to sell for \$32 was sold for \$24. For what fractional part of the marked price was it sold?

6. Susan spent \$6. This was $\frac{2}{5}$ of all her money. How much did she have?

7. A dealer sold a house for \$8000, and kept .05 of this money as pay for his services. How much did he keep?

8. At a sale a hat sold for \$4.75, or \$1.25 less than the regular price. The reduction was what part of the regular price?

9. Grace gave her mother $\frac{3}{8}$ of her money. She gave her mother \$2.40. How much did Grace have in the beginning?



Unit Three

Meaning of Per Cent

1. Don saves old coins. He has filled a card with Indian head pennies. There are 10 pennies in a row and 10 rows. How many pennies has he mounted on the card?

The total value of the coins on the card is 100 cents, or \$1.00. Each cent is $\frac{1}{100}$ of \$1.00. The word **cent** is derived from the Latin word **centum**, meaning hundred.

2. Give the meaning of century, centennial, and centenarian.

The decimal $\frac{1}{100}$, or .01 may be written 1%, and is read **one per cent**. Per cent means by the hundred, or hundredths.

3. One cent is 1% of \$1.00. What per cent of \$1.00 will 6¢ be? 15¢? 50¢? 11¢?

One whole equals $\frac{100}{100}$, or 100%.

Using Per Cents

1. Standard Mercurochrome is a mixture of Mercurochrome and water. If 2% of the mixture is Mercurochrome, what per cent is water?

2. After a game athletes take a shower and often use rubbing alcohol, which is a mixture of alcohol and water.

70% rubbing alcohol is 70% alcohol and ___% water.

92% rubbing alcohol is 92% alcohol and ___% water.

3. How many pints of alcohol will it take to make 20 pints of 70% rubbing alcohol? **20 pt.**

Think:

$$1\% \text{ of } 20, \text{ or } .01 \text{ of } 20 = .01 \times 20 = .20$$

$$70\% \text{ of } 20, \text{ or } .70 \text{ of } 20 = .70 \times 20 = 14.00$$

$$\begin{array}{r} 20 \text{ pt.} \\ \times .70 \\ \hline 14.00 \text{ pt.} \end{array}$$

4. How many gallons of alcohol will it take to make 200 gal. of 92% rubbing alcohol?

Find each of the following.

5. 6% of 300 15% of 500 39% of 400

6. 11% of 950 35% of 125 24% of 64

7. 3% of \$500 7% of \$124 9% of \$220

8. 91% of \$450 53% of \$210 78% of \$120

9. 2% of \$1.50 1% of \$820 6% of \$2.00

10. If certain milk is 4% butter fat, how many pounds of butter fat will there be in 240 lb. of this milk?

11. Tom spent 8% of \$25.50. What did he spend?

Changing Per Cents to Different Forms

To change a per cent to a decimal, omit the % sign and move the decimal point two places to the left.

1. Study and explain: $45\% = .45$ $.2\% = .002$

Write as decimals.

2. 75% 50% 15% 5% 1% 35% 200%

3. .5% 4.5% 8% .1% 79% 300% 150%

4. 19% 1.8% 92% 6.5% 9% 68% 83%

To change a per cent to a common fraction, write the number, without the sign, over 100. Then reduce the fraction to lowest terms.

5. Change 25% to a common fraction in lowest terms. Study and explain.

$$25\% = .25 = \frac{25}{100} = \frac{1}{4}$$

6. Change $33\frac{1}{3}\%$ to a common fraction in lowest terms. Study and explain.

$$\begin{aligned} 33\frac{1}{3}\% &= .33\frac{1}{3} = \frac{33\frac{1}{3}}{100} = \frac{\frac{100}{3}}{100} = \frac{100}{3} \div \frac{100}{1} = \\ &= \frac{100}{3} \times \frac{1}{100} = \frac{1}{3} \end{aligned}$$

7. Change 4.5% to a fraction in lowest terms. Study and explain. $4.5\% = .045$ $\frac{45}{1000} = \frac{9}{200}$

Write as common fractions in lowest terms.

8. 80% 75% 20% 5% 50% 2% 35%

9. $12\frac{1}{2}\%$ $8\frac{1}{3}\%$ $66\frac{2}{3}\%$ $16\frac{2}{3}\%$ $37\frac{1}{2}\%$ $6\frac{1}{4}\%$

Changing Common Fractions to Per Cents

To change a fraction to a per cent, divide the numerator by the denominator. Carry the result to two decimal places, write the remainder as a common fraction, and then express the quotient as a per cent.

1. Change $\frac{5}{6}$ to a per cent. Study and explain the division at the right.

$$\begin{array}{r} .83\frac{1}{3} = 83\frac{1}{3}\% \\ 6 \overline{)5.00} \\ \underline{48} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

Change the following fractions to per cents.

2. $\frac{1}{3}$	$\frac{1}{4}$	$\frac{3}{5}$	$\frac{8}{9}$	$\frac{5}{7}$	$\frac{2}{3}$	$\frac{1}{16}$	$\frac{9}{25}$
3. $\frac{7}{12}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{2}{5}$	$\frac{5}{8}$	$\frac{5}{16}$	$\frac{3}{40}$
4. $\frac{2}{7}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{11}{12}$	$\frac{9}{16}$	$\frac{7}{50}$	$\frac{17}{50}$	$\frac{21}{25}$

Memorize the per cent and equivalent fraction in each of the following. They are used so often in arithmetic problems and in business that you ought to be able to give them quickly.

5. $\frac{1}{2} = 50\%$	$\frac{1}{6} = 16\frac{2}{3}\%$	$\frac{1}{3} = 33\frac{1}{3}\%$
6. $\frac{5}{6} = 83\frac{1}{3}\%$	$\frac{2}{3} = 66\frac{2}{3}\%$	$\frac{1}{4} = 25\%$
7. $\frac{1}{8} = 12\frac{1}{2}\%$	$\frac{1}{16} = 6\frac{1}{4}\%$	$\frac{3}{8} = 37\frac{1}{2}\%$
8. $\frac{3}{4} = 75\%$	$\frac{5}{8} = 62\frac{1}{2}\%$	$\frac{1}{5} = 20\%$
9. $\frac{7}{8} = 87\frac{1}{2}\%$	$\frac{2}{5} = 40\%$	$\frac{1}{12} = 8\frac{1}{3}\%$
10. $\frac{3}{5} = 60\%$	$\frac{1}{20} = 5\%$	$\frac{1}{25} = 4\%$
11. $\frac{1}{9} = 11\frac{1}{9}\%$	$\frac{4}{5} = 80\%$	$\frac{1}{7} = 14\frac{2}{7}\%$

Finding a Per Cent of a Number

1. James earns \$15 a week. If he gets a 5% raise, how much more will he earn in a week?

Using decimals

Think: $\frac{\$15}{\times .05}$

$$\begin{array}{r} \$15 \\ \times .05 \\ \hline \end{array}$$

2. Tom's father got a $12\frac{1}{2}\%$ increase in salary. If he had earned \$200 a month, what will the increase for a month be?

Using decimals

$$\begin{array}{r} \$200 \\ \times 12\frac{1}{2}\% \\ \hline 100 \\ 400 \\ 200 \\ \hline \$25.00 \end{array}$$

Using common fractions

Think: $12\frac{1}{2}\% = \frac{1}{8}$

$$\begin{array}{r} \$25 \\ 8 \overline{) \$200} \end{array}$$

Find the answers:

- | | | |
|---------------|--------------------------|--------------------------|
| 3. 32% of 650 | $16\frac{2}{3}\%$ of 300 | $6\frac{1}{4}\%$ of 656 |
| 4. 4% of 250 | $8\frac{1}{3}\%$ of 144 | $37\frac{1}{2}\%$ of 168 |
| 5. 36% of 125 | 25% of 648 | $62\frac{1}{2}\%$ of 400 |
| 6. 30% of 720 | $87\frac{1}{2}\%$ of 960 | 75% of 640 |
7. Jack had \$18.75. He spent 4% of it for a ball. What did the ball cost?
8. Ann had \$4.80. She spent 25% of it for a scarf. What did the scarf cost?

To find a given per cent of a number, multiply the number by the given rate.

Comparing Numbers by Dividing

1. Ann earned \$2 and Tom earned \$6. Ann's money is what part of Tom's?

When you compare Ann's money with Tom's, Tom's money is the whole and Ann's is the part. To compare, write the part as the numerator of a fraction and the whole as the denominator. The resulting fraction is the part, or ratio, of Ann's money to Tom's.

$$\frac{\text{numerator}}{\text{denominator}} = \frac{\text{part}}{\text{whole}} \text{ or } \frac{2}{6} = \frac{1}{3}$$

Ann's money is $\frac{1}{3}$ of Tom's.

2. Compare Tom's money with Ann's.

$$\frac{\text{numerator}}{\text{denominator}} = \frac{6}{2} = 3$$

Tom's money is 3 times Ann's.

To compare one number with another by division, write the number to be compared as the numerator of a fraction and the other number as the denominator. Then reduce the fraction to lowest terms.

3. Bill bought a radio for \$24 and sold it for \$30. The cost is what part of the selling price? The selling price is what part of the cost?

Compare:

- | | | |
|-----------------|--------------|------------------|
| 4. 125 with 500 | 70 with 350 | 500 with 125 |
| 5. 18 with 1440 | 16 with 1000 | \$.18 with \$.15 |
| 6. 375 with 500 | 25 with 10 | 10¢ with 15¢ |
| 7. 16 with 64 | 48 with 16 | 25¢ with 15¢ |

Comparing to Find the Per Cent

1. Ann earned \$2 and Tom earned \$6. Ann's money is what per cent of Tom's?

To find the per cent when a part and the whole are given, write the comparison, or ratio, as a common fraction. Then change the fraction to a per cent.

Study and explain.

$$\frac{2}{6} = \frac{1}{3}$$

$$\frac{.33\frac{1}{3}}{3)1.00} = 33\frac{1}{3}\%$$

Ann's money is $33\frac{1}{3}\%$ of Tom's.

2. Compare Tom's money with Ann's.

$$\frac{6}{2} = \frac{3}{1}$$

$$\frac{3.00}{1)3.00} = 300\%$$

Tom's money is 300% of Ann's.

3. There are 1200 seats in the school auditorium. What per cent of the seats are occupied when 144 of them are filled?

Fill in the blanks in the following:

- | | |
|--|--------------------------|
| 4. 8 is ___% of 32 | 162 is <u>3</u> % of 540 |
| 5. 24 is ___% of 360 | 160 is ___% of 480 |
| 6. 35 is ___% of 84 | 75 is ___% of 400 |
| 7. \$15 is ___% of \$3000 | \$120 is ___% of \$6000 |
| 8. Of the 1240 pupils in the Lowell School 930 take part in athletics. What per cent is this? | |
| 9. Mr. Smith can buy a home for \$7840. He has \$2940 in a savings account. What per cent of the price of the home has he in this account? | |



Finding Wholes from Parts

1. Alice has embroidered 40 quilt blocks. This is $\frac{5}{6}$ of the whole quilt. How many blocks does the whole quilt contain?

Think:

$$\frac{5}{6} \text{ of whole} = 40 \text{ blocks}$$

$$\frac{1}{6} \text{ of whole} = 40 \div 5 = 8 \text{ blocks}$$

$$\frac{6}{6} \text{ of whole} = 8 \times 6 = 48 \text{ blocks}$$

$$\text{Short way: } \frac{40}{1} \div \frac{5}{6} = \frac{40}{1} \times \frac{6}{5} = 48$$

Find the numbers that belong in the blanks.

2. 45 is $\frac{5}{9}$ of _____. 21 is $\frac{7}{15}$ of _____.

3. 28 is $\frac{7}{15}$ of _____. 63 is $\frac{21}{25}$ of _____.

4. 52 is $\frac{13}{20}$ of _____. 72 is $\frac{4}{5}$ of _____.

5. 144 is $\frac{3}{5}$ of _____. 80 is $\frac{16}{17}$ of _____.

6. 90 is $\frac{18}{25}$ of _____. 108 is $\frac{9}{100}$ of _____.

7. Mr. Eaton paid \$45 for the use of some money. If this was 3% of the amount he borrowed, how many dollars did he borrow?

Think: $3\% = \frac{3}{100}$

$$\frac{3}{100} \text{ of money} = \$45$$

$$\frac{1}{100} \text{ of money} = \$45 \div 3 = \$15$$

$$\frac{100}{100} \text{ of money} = 100 \times \$15 = \$1500$$

Short way

$$\frac{\$1500}{.03} = \$45.00$$

$$.03 \overline{) \$45.00}$$

$$\uparrow \quad \uparrow$$

To find the whole when the part and rate, or per cent, are given, divide the part by the rate, or per cent.

8. In a certain town 18% of the population is made up of school children. If there are 7,254 school children, what is the population?

9. In a certain town 25% of all the accidents were caused by faulty automobile brakes. If there were 24 such accidents in a year, what was the total number of accidents from all causes that year?

Using decimals

$$\begin{array}{r} 96 \\ .25 \overline{) 24.00} \\ \underline{22 \ 5} \\ 150 \\ \underline{150} \end{array}$$

Using fractions

$$\text{Think: } 25\% = \frac{1}{4}$$

$$24 \times 4 = 96$$

10. How many accidents were there in one year if $33\frac{1}{3}\%$ were caused by poor lighting and there were 27 accidents from this cause?

Find the numbers that belong in the blanks.

11. 72 is 24% of _____. 156 is $33\frac{1}{3}\%$ of _____.

12. 104 is 8% of _____. 55 is $62\frac{1}{2}\%$ of _____.

13. 28 is 4% of _____. 81 is 9% of _____.

14. 113 is $12\frac{1}{2}\%$ of _____. 45 is 3% of _____.

15. 72 is 18% of _____. 144 is 72% of _____.

16. Mrs. Hill paid \$11.90 down on some furniture. If this is 5% of the amount she bought, what was the total cost of the furniture?

17. Mr. Ames pays \$75 a month for rent. This is 15% of his salary. What does he earn a month?

18. Billy's team won 9 games. If this was $37\frac{1}{2}\%$ of all games played, how many games were played?

Gaining Strength in Problem Solving

There are three types of percentage problems. Learn how to solve each type.



I. To find a part, multiply the whole by the rate, or per cent.

5% of 200 is ?

II. To find the rate, or per cent, divide the part by the whole. 10 is ? % of 200?

III. To find the whole, divide the part by the rate, or per cent. 10 is 5% of ?

No pencils, please!

1. Mary had a test of 50 words in spelling. She missed 8% of them. How many did she miss?

2. Ann had a test of 50 words. She missed 10 of them. What per cent did she miss?

3. Tom missed 4 words. This was 2% of the whole test. How many words were in the test?

4. A dealer allowed Mr. Hill \$305 for his old car. This was 25% of the price of the new car that Mr. Hill bought. What did he pay for the new car?

5. Mr. Hill borrowed \$600 to help pay for the new car. If he paid 3% a year for the use of this money, how much did he pay for the loan if he kept it one year?

6. Mr. Smith bought a \$1200 car. He paid 25% down. How much cash did he pay?

Use pencils.

✓7. Mr. Adams saves $7\frac{1}{2}\%$ of his salary. Last month his salary was \$160. How much did he save?

8. There are 800 pupils in a certain school, and 360 of these are boys. What per cent of the pupils are boys? Girls?

✓9. Jack has read 128 pages of his library book. What per cent of the book has he read if there are 512 pages in it?

10. Bill paid \$19.60 for a bicycle. This is 98% of the price for which he sold it. What was the selling price?

11. Mr. Jones traded his old car for \$425 on a new car costing \$1020. What per cent allowance was made for the old car?

12. The income of the Allen family last year was \$1540, and their food cost \$654.50. What per cent of their income was the cost of the food?

✓13. An 18-lb. ham weighed 15 lb. after cooking. What per cent of the weight of the raw ham was the weight of the cooked ham? What per cent of the weight was lost in cooking?

✓14. Ann's mother put 12 doz. eggs in an incubator to hatch. Only 120 of them hatched. What per cent hatched? What per cent did she lose?

15. She has 72 Leghorns in her flock. If this is 12% of the flock, how many chickens does she have in all?

Using Larger Per Cents

1. Four boys undertook to earn \$12 in a month each. At the end of the month, Jack had earned \$6, Elmer, \$12; Tom, \$18; and Henry, \$24. What per cent was each boy's earning of the amount he had set out to earn?

Jack: $\frac{\$6}{\$12} = \frac{1}{2} = 50\%$ Elmer: $\frac{\$12}{\$12} = \frac{1}{1} = 100\%$
 Tom: $\frac{\$18}{\$12} = \frac{3}{2} = 1\frac{1}{2} = 150\%$ Henry: $\frac{\$24}{\$12} = \frac{2}{1} = 200\%$

2. What per cent of the amount each planned to earn would each of the following be?

Jack, \$9; Elmer, \$15; Tom, \$36; Henry, \$48

Find the numbers that belong in the blanks.

3. 150% of 18 is ____ 50 is ____% of 150.

4. 36 is 180% of ____ 275% of 32 is ____.

5. 95 is ____% of 38. 63 is 175% of ____.

6. $133\frac{1}{3}\%$ of 63 is ____ 120 is ____% of 96.

7. 140 is ____% of 28. 700% of 85 is ____.

8. A boys' club had 18 members and gained 24 new members during the first year. What was the per cent of gain in membership?

9. When the first census was taken in the United States in 1790, there were about 4,000,000 persons in the United States. By 1840 there were about 18,000,000 persons. What was the per cent of gain in population from 1790 to 1840?

10. By 1930 there were about 124,000,000 persons in the United States. What was the per cent of gain in population from 1790 to 1930? From 1840 to 1930?

Less Than One Per Cent

Write the following as decimals without using the per cent sign. Hint: The per cent sign represents two decimal places.

1. .5% .05% .75% .02% .25% .03%

2. 1.5% 4.2% 11.23% 8.01% 14.9% .1%

3. Mr. Alt collects rents. He is paid $\frac{1}{2}\%$ of all he collects. What common fraction is this?

$$\frac{1}{2}\% = \frac{1}{2} \text{ of } 1\% = \frac{1}{2} \times \frac{1}{100} = \frac{1}{200}$$

Write the following as common fractions.

4. $\frac{1}{4}\%$ $\frac{3}{4}\%$ $\frac{1}{8}\%$ $\frac{1}{10}\%$ $\frac{1}{3}\%$ $\frac{3}{8}\%$

Write the following as decimals without the per cent sign, as $\frac{1}{2}\% = .00\frac{1}{2} = .005$.

5. $\frac{7}{10}\%$ $\frac{1}{4}\%$ $\frac{3}{4}\%$ $\frac{1}{8}\%$ $\frac{1}{10}\%$ $\frac{3}{8}\%$

Write as decimals without per cent signs.

6. .5% .05% .75% 2.5% 1.8% 5.25%

7. Mr. Alt collected \$40,000 in rents. What did he receive if he got $\frac{1}{2}\%$ of his collections?

Using decimals

$$1\% \text{ of } \$40,000 = \$400$$

$$\frac{1}{2}\% \text{ of } \$40,000 = \$\frac{400}{2} = \$200$$

Using fractions

$$\frac{1}{2}\% = \frac{1}{200}$$

$$\frac{1}{200} \times \$40,000 = \$200$$

8. Find .05% of 240. Find $\frac{1}{4}\%$ of \$1600.

9. Find 4.5% of \$250. Find $\frac{3}{8}\%$ of \$2400.



Selling on Commission

Many times a salesman's pay is a certain part, or per cent, of the sales he makes. The money he is paid is called the **commission**.

1. Tommy sells magazines at 35¢ each. What will be his commission on 50 magazines if the rate of commission is 20%?

2. A real estate man sold a house for \$6500 at 5% commission. What was his commission?

3. A salesman got 15% commission for selling a car for \$750. What was his commission? How much did the owner of the car receive?

Selling price - commission = net proceeds.

4. Find the net proceeds from the sale of an \$8000 farm, if the rate of commission is 9%.

5. Jack gets 3¢ for each 30¢ magazine that he sells. Find his rate of commission.

6. A man earned \$728 selling books on a 40% commission. Find the amount of his sales.

Find the commission and net proceeds.

Sales	Rate	Sales	Rate
7. \$25,000	7%	\$125.50	4%
8. \$12,000	20%	\$68.40	5%

9. A salesman gets a monthly salary of \$125 and a commission of 2% on all sales above \$7500 a month. How much did he earn in a month in which his sales totaled \$11,250?

10. Mr. Hart earned \$3,200 last year by selling at 8% commission. What was the amount of his sales that year?

11. Would you rather sell on a commission basis or a fixed salary?

12. Do you think a poor salesman would rather work on a commission or be paid a fixed salary?

13. From the employer's point of view, what are the advantages of having his salesmen sell on a commission rather than for a fixed salary?

14. In the Teen Town Dress Shop a clerk whose daily sales total more than \$100 receives a 5% commission on the sales over \$100. The following are the sales records of six clerks. Name two who did not get a commission. How much commission did the others receive?

Miss Ames	\$215	Miss Best	\$440
Miss Wells	\$350	Miss Lane	\$95
Miss Kane	\$85	Miss Clay	\$500

15. Tom got \$4 commission for selling \$50 worth of goods. What was his rate of commission?

16. A poultry raiser shipped some turkeys to a commission merchant to sell. The turkeys brought \$681.25. The merchant charged 8% commission and \$32.40 for expenses. He sent what was left to the poultry raiser. How much did he send?

Discounts



1. At the beginning of the season a winter coat was marked \$60. Alice bought it at a discount of 25% at the end of the season. What was the discount?

The marked price is the original price.

The discount is the amount that the original price is reduced.

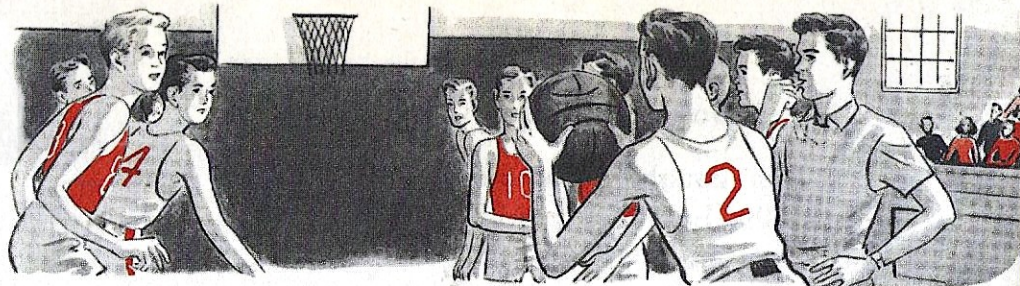
2. Bill bought a \$7.50 football at a discount of 35%. What did he pay for it?

Marked price - discount = net price.

Long way		Short way
\$7.50	\$7.50	Think $100\% - 35\% = 65\%$
$\times .35$	$- 2.62$	
3750	\$4.88	\$7.50
		$\times .65$
2250		3750
\$2.62 50		4500
		\$4.8750 = \$4.88

Find the discount on the following articles.

- Sweater marked \$5.98, discount 15%
- Watch marked \$56.00, discount 5%
- Bicycle marked \$39.50, discount 10%
- Basketball marked \$12.50, discount 40%
- Bathing suit marked \$7.50, discount $33\frac{1}{3}\%$
- Tennis racket marked \$10.00, discount 12%
- Skates marked \$15.00, discount 28%
- Use the short way and find the net price of the articles in problems 3-9.



Free Throws

Check after each throw. A perfect score counts as a point. You have a chance to make 5 points on this page.

First Throw: Write as per cents.

- | | | | | | |
|---------|------------------|------|------------------|------|------------------|
| 1. .05 | .45 | .78 | .89 | .23 | .01 |
| 2. .005 | .001 | 4.00 | 7.00 | .255 | $.66\frac{2}{3}$ |
| 3. .50 | $.12\frac{1}{2}$ | .75 | $.83\frac{1}{3}$ | 4.5 | .002 |

Second Throw: Change to per cents.

- | | | | | | |
|-------------------|----------------|---------------|---------------|-----------------|----------------|
| 4. $\frac{1}{2}$ | $\frac{4}{5}$ | $\frac{1}{8}$ | $\frac{5}{6}$ | $\frac{2}{3}$ | $\frac{9}{40}$ |
| 5. $\frac{7}{50}$ | $\frac{3}{25}$ | $\frac{5}{7}$ | $\frac{8}{9}$ | $\frac{11}{12}$ | $\frac{5}{8}$ |

Third Throw: Write as common fractions.

- | | | | | | |
|---------------------|-------------------|-------------------|-----|-----------------|-----------------|
| 6. 25% | $12\frac{1}{2}\%$ | $83\frac{1}{3}\%$ | 80% | 5% | 75% |
| 7. 20% | $37\frac{1}{2}\%$ | $16\frac{2}{3}\%$ | 30% | 4% | 50% |
| 8. $8\frac{1}{3}\%$ | $62\frac{1}{2}\%$ | 40% | 60% | $\frac{1}{2}\%$ | $\frac{1}{4}\%$ |

Fourth Throw: Find the numbers that belong in the blanks.

- | | |
|------------------------|----------------------------------|
| 9. 18 is ____% of 36. | 51% of \$240 is ____. |
| 10. 5 is 10% of ____. | 12 is $37\frac{1}{2}\%$ of ____. |
| 11. 25 is ____% of 40. | .2% of \$500 is ____. |

Fifth Throw: Change to decimals.

- | | | | | | | | |
|---------------------|------------------|-------------------|------------------|-------------------|------------------|-----------------|-----------------|
| 12. $\frac{1}{4}$ | $\frac{1}{6}$ | $\frac{5}{8}$ | $\frac{1}{3}$ | $\frac{4}{5}$ | $\frac{1}{200}$ | $\frac{3}{250}$ | $\frac{7}{500}$ |
| 13. $\frac{9}{400}$ | $\frac{36}{144}$ | $\frac{250}{900}$ | $\frac{72}{108}$ | $\frac{80}{4000}$ | $\frac{63}{180}$ | | |
| 14. $6\frac{2}{3}$ | $1\frac{3}{8}$ | $4\frac{5}{6}$ | $3\frac{3}{4}$ | $3\frac{2}{5}$ | $5\frac{1}{2}$ | | |

Gain and Loss in Business

1. Tom bought a football for \$7.95. His team wanted the ball and paid him \$8.50 for it. What was Tom's gain, or profit?

2. A merchant bought a football for \$5.90. He sold it to Tom for \$7.95. Is it right to say the merchant made a gain, or profit, of \$2.05? Why does the merchant figure his profit in a different way from Tom's?

From the merchant's point of view, *the difference between the cost and selling price is the gross profit, or margin. The margin includes the cost of doing business (overhead) and the net profit.*

Selling price - total cost = margin.

Margin - overhead = net profit.

3. The merchant in problem 2 figured his overhead on the sale was \$.85. What was his real, or net, gain on the sale?

← SELLING PRICE OR \$7.95 →		
FIRST COST \$5.90	OVER HEAD \$.85	PROFIT \$1.20
← MARGIN →		

4. Mr. Mills bought apples for \$125. He sold them for \$185. Find his profit if his overhead was \$27.50 for shipping and \$15.00 for selling.

5. Make a list of ten overhead expenses that a grocer might have in running his business, such as rent, insurance, waste.

6. Mr. Clark made a margin of \$75 selling a radio. If his overhead on this sale figured \$38.75, what was his profit?

MARGIN OR \$75.00	
OVERHEAD OR \$38.75	PROFIT ?

Fill the blanks in the following.

	Cost	Overhead	Margin	Profit	Selling price
7.	\$25	\$3.17	?	?	\$30.00
8.	\$.89	\$.12	?	?	\$1.45
9.	\$5,000	\$1,250	?	?	\$7,500
10.	\$100	\$12.50	\$50	?	?
11.	?	\$200	\$500	?	\$700
12.	\$.35	?	?	\$.02	\$.39
13.	\$.75	?	\$.25	\$.13	?
14.	?	?	\$1.23	\$.50	\$4.00

Use **c** for **cost**, **m** for **margin**, **s** for **selling price**, **p** for **profit**, **o** for **overhead**, and complete the following formulas, as, $s - c = m$.

15. $s - m = ?$ $m - o = ?$ $m + c = ?$

16. $o + p = ?$ $m - p = ?$ $c + o + p = ?$

17. Mr. Cook bought a car for \$450. He figured his overhead in handling it was \$25. If he had to sell it for \$400, what was his loss?

Paying Interest

Banks and persons who lend money charge **interest**, or a certain per cent of the money loaned, for its use per year. Interest can be thought of as rent that the borrower pays to the owner of the money. The money borrowed is called the **principal**. The rent, or money paid for the use of borrowed money, is the **interest**. The per cent charged is the **rate** of interest.

1. Mr. Smith borrowed \$600 at 5% interest for one year. How much interest did he pay?

Think

$$1\% \text{ of } \$600 = \$6$$

$$5\% \text{ of } \$600 = 5 \times \$6 = \$30$$

Work

$$\begin{array}{r} \$600 \\ \times .05 \\ \hline \$30.00 \end{array}$$

2. How much interest would Mr. Smith pay if he borrowed \$600 at 4% interest for one year? Since 4% may also be written $\frac{4}{100}$, the interest may also be found in this way.

$$\$600 \times \frac{4}{100} = \$24$$

Use both methods and find the interest on the following for one year.

Principal	Rate	Principal	Rate
3. \$300	6%	\$450	3%
4. \$500	4%	\$560	5%
5. \$800	5%	\$900	4%
6. \$12.50	7%	\$168.50	2%

7. Find the interest on \$300 at 4% for 3 years.

Using decimals

$$\begin{array}{r} \$300 \text{ principal} \\ \times .04 \text{ rate} \\ \hline \$12.00 \\ \times 3 \text{ time} \\ \hline \end{array}$$

\$36.00 interest

Cancellation using fractions

$$\$300 \times \frac{4}{100} \times \frac{3}{1} = \$36$$

Interest = principal $\times$ rate $\times$ time in years.

Find the interest by both methods.

Principal	Rate	Time	Principal	Rate	Time
8. \$400	5%	2 yr.	\$350	7%	6 yr.
9. \$160	4%	3 yr.	\$720	3%	3 yr.

Not all loans are made for a full year. Since the interest rate is for one year, the time in days or months must be changed to parts of a year. Count 360 days or 12 months as an interest year.

10. Write the following as parts of a year:

90 da. 8 mo. 4 yr. 6 mo. 3 mo. 12 da.

11. Find the interest on \$180 at 3% for 60 da. Explain and work the following:

$$\$180 \times \frac{3}{100} \times \frac{60}{360} = \text{interest}$$

Use cancellation and find the interest on:

- \$200 at 6% for 2 mo.
- \$720 at 3% for 24 da.
- \$5,400 at 6% for 2 yr. 6 mo.
- \$9,000 at 4% for 1 mo. 15 da.

Review Problems Using Percentage

1. A suit marked \$50 was sold for \$45. What was the rate of discount from the marked price?

2. Mr. Lane earned \$45 selling goods at a 15% commission. What were his sales?

3. A dealer bought a car for \$350 and sold it for \$425. What was his margin? His overhead was \$17.50. What was his net profit? Was his net profit more than 12% of the selling price?

4. Tom won 17 out of 20 tennis matches. What per cent did he win?

5. Bill gets a salary of \$25 a week and a commission of 15% on all weekly sales over \$500. What does he earn when his weekly sales are \$875?

6. Mr. Hill paid \$25 interest for the use of some money for one year. If the interest rate was 2%, how much was the loan?

7. Tom paid \$3.50 for the loan of \$70 for one year. What was the rate of interest paid?

Find the interest on:

8. \$250 at 6% for 72 da.

9. \$6500 at 2% for 4 yr. 8 mo.

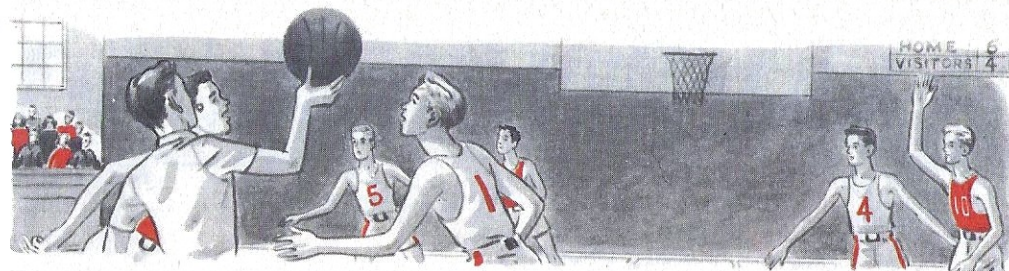
10. \$7500 at 5% for 60 da.

11. \$2700 at 4% for 10 da.

12. \$360 at 1% for 18 da.

13. \$1200 at 3% for 1 yr. 7 mo.

14. \$1500 at 5% for 10 mo.



The Tip-Off

Here is another tip-off. Do your best because right answers bring you nearer your goal. Mark papers after each part and keep your score.

Part One: Find the missing numbers.

Marked Price	Discount	Rate	Net Price
1. \$150	—	15%	—
2. —	\$25	5%	—
3. \$400	—	—	\$350
4. —	\$90	—	\$1710

Part Two: Find answers for blanks.

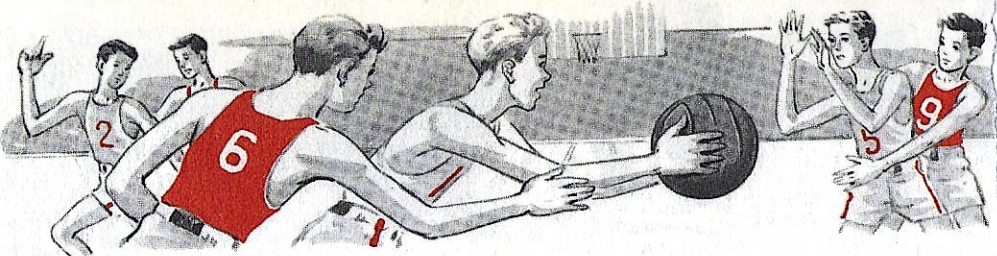
Sales	Commission	Rate	Net Proceeds
5. \$2500	\$125	—	—
6. \$75.50	—	2%	—
7. —	\$100	12½%	—
8. —	\$18.75	—	\$37.50

Part Three: Find the interest.

Principal	Rate	Time	Principal	Rate	Time
9. \$600	5%	3 yr.	\$1,200	6%	30 da.
10. \$5,300	4%	15 da.	\$54	5%	6 mo.
11. \$150	6%	12 da.	\$900	3%	4 yr.

You had a chance to get 22 right answers on this page. If you got 20, or more, the ball is heading toward your goal. Work page 77.

Others will recover the ball by working page 76.



Recovering the Ball

This practice will improve your score. Where you find you are still making mistakes, study the pages referred to in parentheses.

Write each in two other ways. (55, 56)

1. 5% $\frac{45}{100}$.75 100% $\frac{300}{100}$.02

Change to decimals. (56)

2. $\frac{2}{3}$ $\frac{1}{16}$ $\frac{5}{6}$ $\frac{7}{8}$ $\frac{1}{12}$ $\frac{9}{50}$ $\frac{3}{8}$

Write as common fractions in lowest terms.

3. $12\frac{1}{2}\%$ 75% 35% 8% 2% $4\frac{1}{2}\%$ 1% (55, 65)

Find answers for the blanks. (57, 59, 60)

4. 18 is $\frac{\quad}{\quad}\%$ of 27. 24 is 50% of $\frac{\quad}{\quad}$.

5. 98% of \$500 is $\frac{\quad}{\quad}$. 80 is $\frac{\quad}{\quad}\%$ of 640.

6. 12 is $\frac{\quad}{\quad}\%$ of 9. 91.5% of \$200 is $\frac{\quad}{\quad}$.

7. $87\frac{1}{2}\%$ of 2400 is $\frac{\quad}{\quad}$. 200% of \$350 is $\frac{\quad}{\quad}$.

8. All pupils who made mistakes in Ex. 1-4 on page 75 will form a group to work page 68. Correct papers for each other.

9. Those missing Ex. 5-8 on page 75 will work pages 66 and 67. Correct papers.

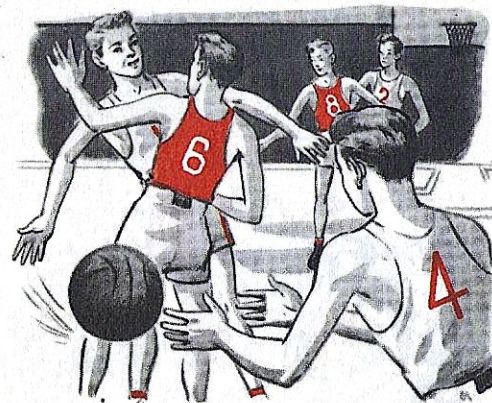
10. Those missing Ex. 9-11 on page 75 will form a group to work pages 72 and 73. Exchange papers and find mistakes.

11. Work page 69, racing with a partner.

Passing the Ball

Work until you get a perfect score. Then help pupils who have finished page 76 while they try these problems.

Find the missing amounts.



	Selling Price	Cost	Margin	Overhead	Net Profit
1.	\$49.50	\$30	—	\$6.75	—
2.	\$235.75	—	\$18.50	\$7.85	—
3.	\$700	—	—	\$8.95	\$62.50
4.	—	\$.18	\$.07	—	\$.05

5. Mr. Bell earned \$2500 last year. This year his salary was increased 12%. What will he earn this year?

6. The discount on the marked price of a dress was \$1.50. If the rate of discount was 5%, what was the marked price?

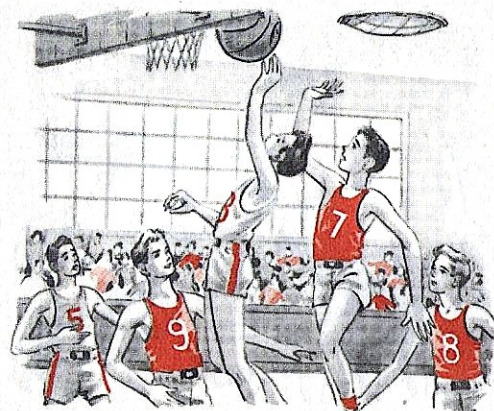
7. Find the interest on \$200 at 3% for 9 da.

8. What will it cost to borrow \$1500 for 2 yr. 3 mo. at 4% a year?

9. Mr. Wells sold a house for \$7,500 at 3% commission. What were the net proceeds of the sale? Use the short way.

10. Jack had \$250 and spent 8% of it. How much had he left?

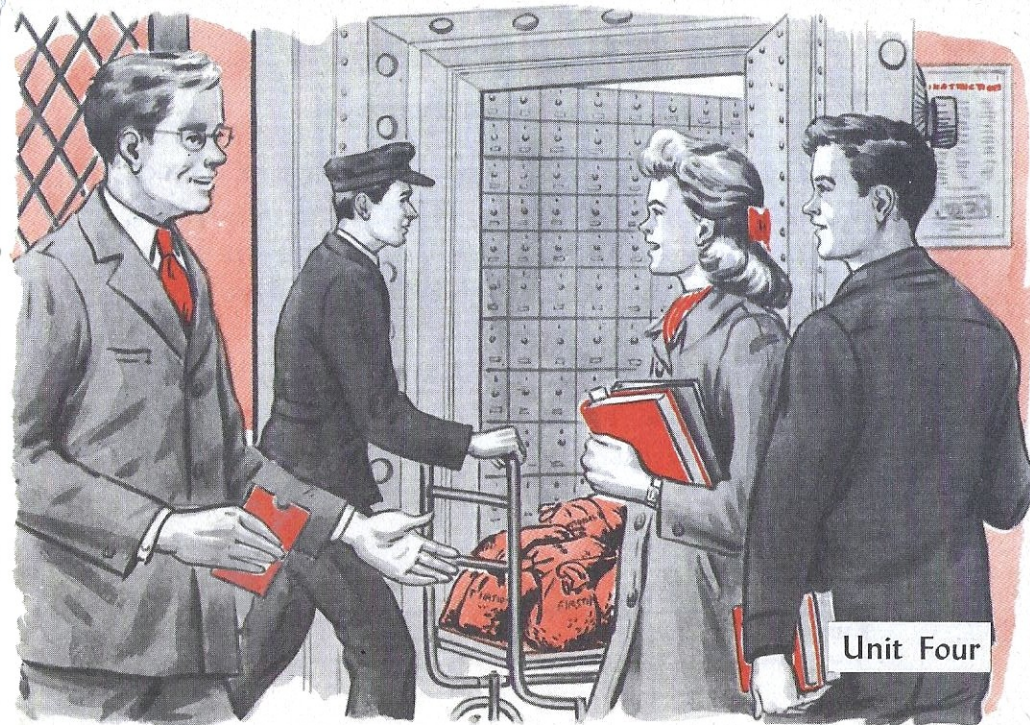
11. Tom charged \$1.50, or 5%, commission for selling Bill's bicycle. Find the selling price.



Goal for Unit Three

Toe the line for a goal throw! You need nine right answers for a perfect score.

1. A boy sold 50 magazines at 5¢ each and 28 at 10¢ each. How much did he make at 20% commission?
2. There were 60 words on a spelling test. Ann got 54 of them correct. What per cent did she get correct?
3. Bill bought a \$3.95 hat at 20% off. What did he pay for it?
4. A real estate man charged 5% for selling a house. If he received \$350 for making the sale, what was the selling price of the house?
5. The selling price of a tube of tooth paste was \$.49. The cost was \$.38. What was the margin? Find the net profit if the overhead was \$.03.
6. Mr. Bell earns \$250 a month. He pays \$37.50 a month rent. What per cent of his monthly earnings does he spend for rent?
7. Mr. Bell's family spends 12% of his income for clothing. How much will the family spend for clothing in a year?
8. Find the interest on \$300 at 4% for 120 da.
9. What will it cost to borrow \$2500 for 3 yr. 6 mo. at 2% interest?



The Services of a Bank

If there were no banks, people would have to use cash to take care of their business transactions. Why would this be very slow, costly, and risky? Banks assist in the exchange of money and give many valuable services such as **safe-keeping of money; checking accounts; safe deposit boxes** for the protection of important papers, jewelry, and other valuable property from fire, theft, and other loss; **lending of money; giving sound advice** concerning money matters; and **collecting** checks, notes, and drafts on local or distant banks.

Opening a Bank Account

When you open a bank account, you are asked to fill out a signature card. This card is placed on file and is used to check the signature on each check or withdrawal slip charged against your account.

1. In what way is this card a protection to you?
2. If the bank should give money from your account to some dishonest person who represented himself as you, would the bank be held responsible?

NAME OF DEPOSITOR		BOOK NUMBER
Allen C. Bayle		1870
THE AMERICAN NATIONAL BANK		
I hereby agree to the By-Laws, Rules and Regulations of the AMERICAN NATIONAL BANK,		
Sign here <i>Allen C. Bayle</i>		
Telephone Riverside 4283		
Residence	1713 Capers Avenue	
Occupation	Auditor	Date March 27, 1948

On the signature card the customer signs his name the way it will be written at all times when doing business with the bank. In addition, the card will also have the address and telephone number of the customer.

After this card is made out, the clerk usually gives the customer a bank or pass book, in which money put in the account or taken from it may be recorded.

Bank Deposits

Money placed in a bank is called a **deposit**. The person making the deposit is called the **depositor**. The clerk at the bank who receives or pays out money is called the **teller**.

When a deposit is made, either the depositor or the teller makes out a deposit slip similar to the one shown here. Deposit slips usually show the amount of currency and the amount of silver in the deposit, and each check is listed separately.

1. How much silver did Allen C. Bayle deposit? Does "silver" also include cents?

Bring some deposit slips to school, or copy the form shown here.

Make a deposit slip for the following deposits.

2. Currency \$25; silver \$27.35; checks for \$12.52, \$5.90, \$72.17

3. Two five-dollar bills, 3 quarters, 5 dimes, and 7 cents.

4. What is meant by "currency" on a deposit slip? What is currency according to the dictionary?

THE AMERICAN NATIONAL BANK		
Sept. 15 1948		
Credit	<i>Allen C. Bayle</i>	
Address	<i>1713 Capers Ave.</i>	
	Dollars	Cents
Currency	25	00
Silver	27	35
Coupons		
Checks	12	52
	5	90
	72	17
Total	119	86

Checking Accounts and Checks

A person who puts money in the bank may place his money either in a **savings account** or in a **checking account**. Money can be drawn from a savings account only by going to the bank in person. A **withdrawal slip** must be made out and presented to the teller who will pay the amount stated on the withdrawal slip.

Persons who have a checking account may withdraw money from the bank or transfer money to another person by means of a check. A **check** is a *signed order directing a bank to pay a certain amount of money to a stated person or company*.

The person who has written the check authorizing the transfer of money from his account to another person or company is called the **maker** of the check. The one who receives the money is called the **payee**. The **face** of the check is the amount for which it is written.

No. <u>69</u>	\$ <u>15.75</u>	St. Louis, Mo. <u>June 29</u> 19 <u>48</u>	No. <u>69</u>
Date <u>June 29</u> 19 <u>48</u>	THE AMERICAN NATIONAL BANK		
To <u>J.R. Hay</u>	PAY TO THE ORDER OF <u>John R. Hay</u> \$ <u>15.75</u>		
For <u>Labor</u>	<u>Fifteen and 75/100</u> DOLLARS		
Bal. Bro't For'd. <u>183</u>	Dollars	Cents	
Amt. Deposited <u>64</u>			
Total <u>15.75</u>			
Amt. This Check <u>167</u>			
Bal. Card For'd. <u>89</u>			
SAFE DEPOSIT BOXES FOR RENT <u>Labor</u>			

Exchanging Money by Checks

1. Who is the maker of the check shown on page 82? The payee?
2. What is the face of the check shown?
3. For what purpose was this check written to Mr. Hay?

The part of the check at the left of the dotted line is called the **stub**. When a check is torn from the check book, this stub stays in the book and serves as a record of the check issued.

4. How much money did Mr. Bayle have in the bank before he wrote this check?
5. How did he find his balance after writing the check?

6. Get some blank checks from a bank, or draw forms of checks and stubs like the one used on the opposite page. Fill out one of the stubs to show the following. Mr. Bayle's next check is No. 70. It is for \$24.00 paid to the Ames Electric Company for a fan. Since drawing check No. 69, he has deposited \$75.00. Date the check July 5, 1948.

7. On July 8, 1948, Mr. Bayle wrote check No. 71 to the Ideal Motor Company for \$38.18 in payment for some tires. Write the stub and check for this payment.

8. What is the advantage of paying all bills by check?
9. Why should all canceled checks be kept?

Endorsing Checks

When a person presents a check at the bank or to another person for payment, he must endorse the check unless it is drawn on his own account and made out to **bearer**. The endorsement should be written on the back of the check along the side torn from the stub. There are many ways of endorsing a check. Here are three of the most commonly used.

Endorsement in blank: To endorse a check in blank the person cashing the check writes his name across the back. This makes the check payable to the bearer, that is, anyone who has the check can cash it. This type of endorsement should be used only when the check is being presented at a bank. Otherwise it is a very poor form of endorsement. Why?

St. Louis, Mo. July 27 1948 No. 146

THE AMERICAN NATIONAL BANK

PAY TO THE ORDER OF James W. Brown \$ 34⁵⁰/₁₀₀

Thirty four and ⁵⁰/₁₀₀ DOLLARS

SAFE DEPOSIT BOXES FOR RENT Allen C. Bayle

Endorsement in full: A safer form of endorsement tells to whom the check is payable. No one can cash this check (top of page 85) except Robert M. Wills unless Mr. Wills endorses it.

Pay to the order of
Robert M. Wills
James W. Brown

July 27 1948 No. 146

ATIONAL BANK

V. Brown \$ 34⁵⁰/₁₀₀

over and ⁵⁰/₁₀₀ DOLLARS

Allen C. Bayle

Endorsement without recourse: A person who endorses a check in blank or in full guarantees the payment of that check. If he wishes to transfer a check without guarantee of its payment, he endorses it without recourse. Would you be willing to accept a check with such an endorsement?

Without Recourse
James W. Brown

Cautions About Writing Checks

1. Use pen and ink at all times in writing and endorsing checks. Why?
2. Begin at the left of each line and fill all blank spaces at the right with lines. Why? Copy a check on the blackboard. Show how an improperly written check could be altered.
3. If you make an error in writing a check, write a new one and destroy the other. Why?
4. Never sign a blank check. Why?
5. Do not make check payable to "Cash" or "Bearer." Why?

Monthly Statements

Most banks send each customer a **monthly statement** summarizing his banking business during the preceding month. Checks which have been paid by the bank are canceled by stamping or perforating the word **canceled** on each check. These canceled checks are returned with the statement to the customer. Every customer should verify his statement as soon as it is received. Sometimes banks make errors.

THE AMERICAN NATIONAL BANK, ST. LOUIS, MO.			
IN ACCOUNT WITH			
Allen C. Bayle 1713 Capers Ave.			
CHECKS IN DETAIL	DEPOSITS	DATE	THE LAST AMOUNT IN THIS COLUMN IS YOUR BALANCE
BALANCE BROUGHT FORWARD		OCT 31 48	2,780.32*
17.00 —		NOV 8	2,763.32*
34.24 —		NOV 15	2,729.08*
7.75 —		NOV 24	2,721.33*
19.50 —		NOV 24	2,701.83*
122.46 —	797.50	NOV 28	3,376.87*

1. Read the statement above. Explain how the bank finds the balance at the beginning of the month.

2. How can you check this statement to prove it is correct?

Usually if errors in statements are not reported to the bank in ten days, the account is considered correct.

3. Banks are put to considerable expense in taking care of a checking account for a customer. What are some of these expenses?

4. Do you think a bank could afford to pay a customer interest on a checking account?

5. Some banks ask the customer to pay a "service charge" for handling his checking account. Find out what banks in your neighborhood do about a "service charge."

6. Does it cost a bank as much to handle a savings account as a checking account? Give reasons for your answer.

Banks pay interest on savings accounts. Different banks have different rules about paying interest. Interest may be paid quarterly, semi-annually, or annually, depending on the rules of the bank.

7. Find out what rate of interest banks in your community pay.

8. Find how many times a year interest is computed and added to a savings account.

9. Bring a savings account pass book to school and read the rules governing savings accounts at the bank where the book was issued.

Banks Lend Money

Banks lend money to responsible persons. A large part of the income of a bank comes from interest received on loans. When banks lend money, they require the borrower to sign a written promise to repay the money. Such a written promise is called a **promissory note**.

Mr. Sam C. Young owns a hardware store. He needs \$500 to enlarge the store. His bank has agreed to lend him \$500. Read the promissory note that Mr. Young has signed.

\$ 500.00	ST. LOUIS, MO., July 1 1948
Ninety days AFTER DATE, I	
PROMISE TO PAY TO THE ORDER OF	
The American National Bank	
Five Hundred	DOLLARS
FOR VALUE RECEIVED, PAYABLE AT THE AMERICAN NATIONAL BANK.	
THIS NOTE BEARS INTEREST AT THE RATE OF 6 PER CENT PER ANNUM FROM DATE UNTIL PAID.	
ADDRESS	1213 Church St. Sam C. Young

1. How long may Mr. Young keep the money borrowed on the note above?
2. What rate of interest does he pay for the use of this money?
3. What is the date of the note?
4. How would the promissory note read if Mr. Young had borrowed \$350, January 25, 1949, at 4%?

In the promissory note shown here, Sam C. Young is the **maker**. The American National Bank is the **payee**. The principal, usually called the **face** of the note, is \$500. This note is interest bearing, and it is a **time note** since it states the length of time for which the money is borrowed.

In the note above the interest on \$500 at 6% for 90 days would be \$7.50.

$$i = prt$$

$$i = \frac{500}{1} \times \frac{6}{100} \times \frac{90}{360} = \frac{30}{4} = \$7.50$$

The **amount** of this note would be the principal plus the interest, or,

$$\$500 + \$7.50 = \$507.50$$

5. How much interest would Mr. Young pay if he had borrowed \$500 at 3% for 60 da.?
6. Find the amount of a note for \$600 at 4% for 120 da.
7. Find the interest on a note for \$1500 at 5% for 90 da.
8. Mr. Lane borrowed \$200 from Mr. Ellis. He gave Mr. Ellis a promissory note stating that the money would be returned in 90 days and interest would be paid at 6%. What was the amount of the note?
9. Write and sign a promissory note: face, \$500; time, 6 mo.; payee, your father or mother; date, today.

Making Notes Secure

1. If you lent money to a friend, would you expect him to give you a promissory note? Why?

2. Would you lend the money if you thought your friend could not repay you?

Banks will not lend money to persons who are not likely to pay the loan. Usually some form of security is required, so that if the maker of a promissory note cannot pay, the bank will be able to collect the money. The usual forms of security are:

Having one or more persons sign the note with the maker. These co-signers are responsible for the payment if the maker fails to pay.

Offering real estate or personal property to guarantee the payment. If the maker fails to pay, this property may be sold to pay the loan.

In the following note, Mr. Roscoe has pledged security.

\$ 5000.00	St. Louis,	July 27	1948
60 days		after date	promise to pay to the order of
THE AMERICAN NATIONAL BANK			
Five thousand		DOLLARS,	
for value received, payable at The American National Bank,			
The undersigned has this day pledged with the said Bank the following securities, viz:			
100 shares Am. Tel. & Tel.			
Due	Sept. 25, 1948		
Address	2116 Church St.		
		L. R. Roscoe	

Finding Date of Maturity

The date on which a note falls due is called the **date of maturity**.

1. In the note shown on page 90, Mr. Roscoe borrowed \$5000 on July 27, for 60 da. What is the date of maturity?

The exact number of days must be counted.

Think: July has 31 days. On July 27, there are 4 days left in July. August has 31 days making a total of 35 days. To make 60 days twenty-five days must be taken from September. $(60 - 35 = 25)$

	Days
July	31
	-27
	4
August	31
September	25
	60

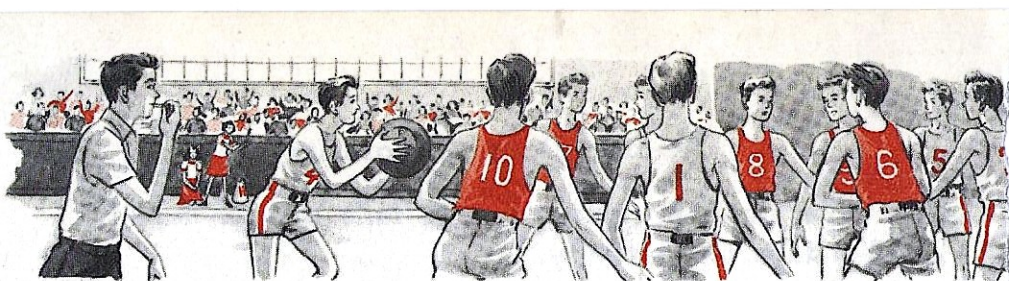
September 25 is the date of maturity.

2. What would be the date of maturity if the note were to run 30 days? 90 days? 120 days?

3. On what day should Mr. Young return the money borrowed on the note shown on page 88?

Find the date of maturity for the following notes.

Date of note	Time to run	Date of note	Time to run
4. March 14	30	7. June 3	180
5. September 3	90	8. May 2	60
6. November 25	120	9. October 15	90



Free Throws

Check after each throw. You need a perfect score to count a throw as a point. Try to make four points.

First Throw:

Change to fractions or mixed numbers.

1. .20 $16\frac{2}{3}$.04 $12\frac{1}{2}$ $06\frac{1}{4}$
2. .025 .004 .375 .001 .005
3. 1.50 $133\frac{1}{3}$ $187\frac{1}{2}$ 2.25 $116\frac{2}{3}$
4. .24 .045 $06\frac{2}{3}$.80 .036

Second Throw:

Change to decimals.

5. $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{6}$ $\frac{3}{8}$ $\frac{2}{3}$ $\frac{1}{50}$ $\frac{1}{250}$ $\frac{3}{500}$
6. $3\frac{1}{3}$ $2\frac{5}{8}$ $1\frac{5}{6}$ $6\frac{1}{4}$ $1\frac{3}{5}$ $6\frac{5}{8}$

Third Throw: Add.

7. $2.26 + 53.26 + 4.84 =$ $3.6 + .36 =$
8. $.16 + 16 + 1.60 =$ $.0089 + 29 =$
9. $5.079 + 8 + 4.596 =$ $.36 + 8.39 =$

Fourth Throw: Subtract.

10. $48.7 - 13.8 =$ $5000 - .5966 =$
11. $10.7160 - .1716 =$ $.5320 - .3555 =$
12. $42 - 6.68 =$ $452.895 - 17 =$

If you did not get four perfect scores, practice page 333, 335.

Finding Time Between Dates

Sometimes money is not borrowed for a given number of days. Instead, the face of the note is to be paid **on demand**.

1. How is the following note different from the note shown on page 88?

\$ 1000	ST. LOUIS, MO.,	August 9	1948
<i>On Demand</i>		AFTER DATE, I	
PROMISE TO PAY TO THE ORDER OF THE			
AMERICAN NATIONAL BANK		87-3	
<i>One Thousand</i>		DOLLARS	
FOR VALUE RECEIVED, PAYABLE AT THE AMERICAN NATIONAL BANK,			
THIS NOTE BEARS INTEREST AT THE RATE OF <u>5</u> PER CENT PER ANNUM FROM DATE UNTIL PAID.			
ADDRESS <u>1916 Johnson St.</u>		<u>Robert C. Ware</u>	

2. If Mr. Ware paid the note above on Nov. 14, 1948, for how many days must he pay interest?

The exact number of days must be found.

Explain the work shown at the right.

Find the number of days for which interest must be paid on the following notes.

	Days
August	31
	<u>-9</u>
	22
September	30
October	31
November	14
	<u>97</u>

Date of making	Date settled
3. Apr. 19, 1947	July 29, 1947
4. Nov. 2, 1948	Jan. 25, 1949
5. June 7, 1948	Jan. 25, 1949

6. How much interest would Mr. Ware pay on the note above if he settled it Oct. 8, 1948? Dec. 7, 1948? Feb. 5, 1949?

Bank Discount

Some banks collect the amount of a note (face plus interest) on the date of maturity. Sometimes, however, the interest is taken out when the loan is made. This is called **discounting** a note. The interest deducted is called the **bank discount**.

Face - bank discount = proceeds of a note

1. Mr. White borrowed \$500 from his bank for 90 days at 6%. If his bank deducted the interest at the time the loan was made, what was the bank discount? What were the proceeds?

$$\begin{array}{r} 5 \qquad 3 \qquad 1 \\ 500 \times 6 \times 90 = \frac{15}{2} = \$7.50 \\ \hline 100 \quad 360 \\ 1 \quad 4 \\ 2 \\ \$500.00 \text{ face} \\ \underline{7.50 \text{ bank discount}} \\ \$492.50 \text{ proceeds} \end{array}$$

In bank discount, a borrower pays the bank the face of the note at maturity.

2. How much did Mr. White pay the bank at the end of 90 days?

Find the proceeds of the following notes.

	Face	Time	Rate
3.	\$5000	9 mo.	5%
4.	\$1200	60 da.	$4\frac{1}{2}\%$
5.	\$750	45 da.	6%
6.	\$9000	12 da.	6%
7.	\$1650	7 mo.	3%
8.	\$2700	180 da.	$4\frac{1}{2}\%$
9.	\$8100	24 da.	5%

Gaining Strength in Problem Solving

No pencils, please!

1. Read the following formulas giving the word for which each letter stands.

$$i = p \times r \times t \qquad p = \frac{i}{r \times t} \qquad r = \frac{i}{p \times t}$$

Give the formula for each problem. Then solve.

2. The interest on \$400 at 3% for 2 years is how many dollars?

3. The interest on \$600 for 3 years is \$36. What is the interest for 1 year? What is the rate of interest?

4. Mr. Jones paid \$15 for the use of some money for 3 years. If the rate of interest was 5%, how much money did he borrow?

5. Find the interest on \$1 at 5% for 3 years.

6. How much interest must I pay to borrow \$200 at 4% for 90 days. Hint: Compare 90 da. with 360 da.

7. Jack paid \$16 interest to borrow \$80 for 4 years. What was the interest for one year? What was the rate of interest paid?

8. Find the interest on \$6 at 3% for 60 days.

9. Mrs. West paid \$20 to borrow some money for 2 years at 5%. How much did she borrow?

10. A company borrowed \$15,000 for 5 years at 2%. What did it cost to borrow this money?

Using Interest Tables

Banks, loan companies, and persons who have much interest to figure often make use of interest tables. There are many kinds of interest tables; the following is one of the simplest.

Table: 6% Simple Interest

Days	\$100	\$200	\$300	\$400	\$500	\$600	\$700	\$800	\$900
1	\$.017	\$.033	\$.05	\$.067	\$.083	\$.10	\$.117	\$.133	\$.15
2	.033	.067	.10	.133	.167	.20	.233	.267	.30
3	.050	.100	.15	.200	.250	.30	.350	.400	.45
4	.067	.133	.20	.267	.333	.40	.467	.533	.60
5	.083	.167	.25	.333	.417	.50	.533	.667	.75
6	.100	.200	.30	.400	.500	.60	.700	.800	.90
7	.117	.233	.35	.467	.583	.70	.817	.933	1.05
8	.133	.267	.40	.533	.667	.80	.932	1.067	1.20
9	.150	.300	.45	.600	.750	.90	1.050	1.200	1.35
10	.167	.333	.50	.667	.833	1.00	1.167	1.333	1.50
20	.333	.667	1.00	1.333	1.667	2.00	2.333	2.667	3.00
30	.500	1.000	1.50	2.000	2.500	3.00	3.500	4.000	4.50
40	.667	1.333	2.00	2.667	3.333	4.00	4.667	5.333	6.00
50	.833	1.667	2.50	3.333	4.167	5.00	5.833	6.667	7.50
60	1.000	2.000	3.00	4.000	5.000	6.00	7.000	8.000	9.00
90	1.500	3.000	4.50	6.000	7.500	9.00	10.500	12.000	13.50

Using the table to figure the interest on \$500 for 76 days at 6%, we find—

\$5.00 interest for 60 days

.833 interest for 10 days

.500 interest for 6 days

\$6.333 interest for 76 days on \$500

1. What would the interest on \$500 for 76 days at 3% be? At 2%? At 4%? At 5%? Hint: Compare the given per cent with 6%.

Use the interest table and find the interest on the following loans.

	Principal	Rate	Time
2.	\$400	6%	93 da.
3.	\$800	3%	100 da.
4.	\$900	2%	186 da.
5.	\$200	4%	88 da.
6.	\$700	5%	115 da.

7. How could you find the interest on \$40 at 6% for 30 days, using the interest table? Hint: Compare \$40 with \$400.

8. Find the interest on \$90 at 6% for 180 days.

Use interest table to find the following:

9. What will be the interest on a \$600 loan at 3%, borrowed August 20 and settled September 19 of the same year?

10. Find the interest on \$60 at 2% from April 15 to December 31 of the same year.

11. Find the interest on \$90 at 4% for 190 days.

12. Mr. Smith borrowed \$70 to pay a doctor bill. He used the money from March 2 to January 11 of the following year. At 3% how much interest did he pay?

13. Find the interest on \$1800 at 6% from November 13, 1948 to January 30, 1949.

Compound Interest

Tom read that \$100 placed in a savings company at 4% would amount to \$148.59 in 10 years. Tom was puzzled. He knew the interest on \$100 at 4% for 1 year was \$4, and $10 \times \$4 = \40 .

His father explained that the company paid \$48.59 instead of \$40 interest at the end of 10 years because it paid interest on all interest earned, as well as on the principal.

Interest paid on interest earned is called compound interest.

The following shows the amount and the compound interest on \$100 at the end of two years, interest compounded every six months at 4%.

<u>\$100.00</u>	<i>Principal</i>
<u>2.00</u>	<i>Interest for first 6 mo.</i>
<u>\$102.00</u>	<i>Amount at end of first 6 mo.</i>
<u>2.04</u>	<i>Interest for second 6 mo.</i>
<u>\$104.04</u>	<i>Amount at the end of one yr.</i>
<u>2.08</u>	<i>Interest for third 6 mo.</i>
<u>\$106.12</u>	<i>Amount at end of 18 mo.</i>
<u>2.12</u>	<i>Interest for fourth 6 mo.</i>
<u>\$108.24</u>	<i>Amount at end of 2 yr.</i>
<u>Less 100.00</u>	<i>Original deposit</i>
<u>\$ 8.24</u>	<i>Compound interest for 2 yr.</i>

You can see that at the end of 2 years the interest is \$8.24, instead of \$8.00.

1. Continue the work shown on page 98 and find the amount at the end of 10 years. Compare the compound interest with the simple interest for 10 years.

When interest is added to the principal once a year, it is said to be compounded annually. Some banks compound the interest semi-annually, or even quarterly. Explain.

2. Copy the following table on the blackboard so that it can be read easily.

Compound Amount of \$1

Number of Years	Compounded at 2%		Compounded at 3%		Compounded at 4%	
	Semi-annually	Annually	Semi-annually	Annually	Semi-annually	Annually
1	1.0201	1.0200	1.0302	1.0300	1.0404	1.0400
2	1.0406	1.0404	1.0614	1.0609	1.0824	1.0816
3	1.0615	1.0612	1.0934	1.0927	1.1262	1.1249
4	1.0829	1.0824	1.1265	1.1255	1.1717	1.1699
5	1.1046	1.1041	1.1605	1.1593	1.2190	1.2167
6	1.1268	1.1262	1.1956	1.1941	1.2682	1.2653
7	1.1495	1.1487	1.2318	1.2299	1.3195	1.3159
8	1.1726	1.1717	1.2690	1.2688	1.3728	1.3686
9	1.1962	1.1951	1.3073	1.3048	1.4282	1.4233
10	1.2202	1.2190	1.3469	1.3439	1.4859	1.4802

Using Compound Interest Table

The table on page 99 gives the amount of \$1 at various interest rates, compounded semi-annually and annually.

Compound amount is the principal plus the compound interest.

1. Find the compound amount of \$1 at 3% compounded semi-annually for 5 years.

2. Explain how you would find the compound amount of \$100 at 3% compounded semi-annually for 5 years.

3. Use the table and find the compound amount of \$1 at 2% compounded annually for 3 years.

4. What would be the compound amount of \$1000 at 2% compounded annually for 3 years? What would be the compound amount of \$5000?

Use the table and find the compound amount of the following.

Principal	Rate	Compounded	Years
5. \$300	4%	annually	10
6. \$800	3%	semi-annually	6
7. \$2000	2%	semi-annually	8
8. \$6500	3%	annually	5
9. \$10000	3%	semi-annually	7
10. \$900	4%	annually	5

Compound amount - principal = compound interest.

11. Find the compound interest for problems 5-10 above.



The Tip-Off

1. If you paid L. C. West \$10 by check, who would be the payee? The maker?

2. Write a check payable to yourself from John Doe for \$5.00. Draw a form like one in this unit if you have no blank check.

3. M. D. Swift is paid by check. If he cashed the check at the Star Market, how would he endorse it in full? In blank?

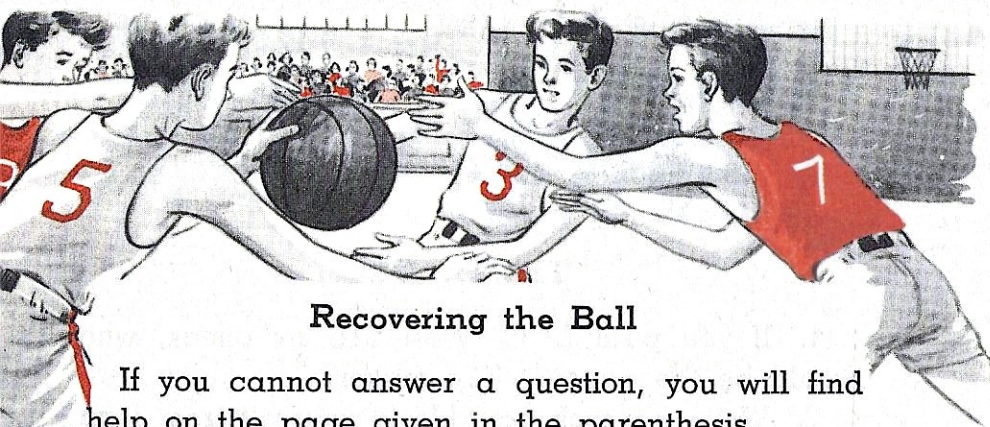
4. J. L. Carr borrowed \$300 from H. C. Roe for 90 days at 6% interest. How much is the interest? Find the proceeds of the note if it is discounted at time of making. Find the date of maturity if the note was dated May 18, 1948.

5. Write a promissory note to represent the note that Mr. Carr gave to Mr. Roe.

Use the table on page 96 and find the interest on:

6. \$500 at 6% for 120 days
7. \$150 at 6% for 90 days
8. \$1,400 at 3% for 70 days
9. \$900 at 2% for 135 days
10. \$12,000 at 5% for 60 days

If you feel you need more practice, do page 102. Otherwise, work page 103.



Recovering the Ball

If you cannot answer a question, you will find help on the page given in the parenthesis.

1. Explain these terms with reference to a bank account: principal, interest, rate of interest (72); checking account (82); compound interest (98); compound amount (100).

2. What is a promissory note? (88)

3. Explain these terms with reference to notes: maker, payee, principal (89), date of maturity (91), security note (90), bank discount (94), proceeds of a note (94).

Find the exact number of days (93):

4. From Mar. 27 to July 15

5. From June 16 to Dec. 25

6. From May 30 to Oct. 16

7. From Jan. 13 to Sept. 30

Use the interest table on page 96 and find the interest on:

8. \$200 at 8% for 60 days

9. \$500 at 4% for 90 days

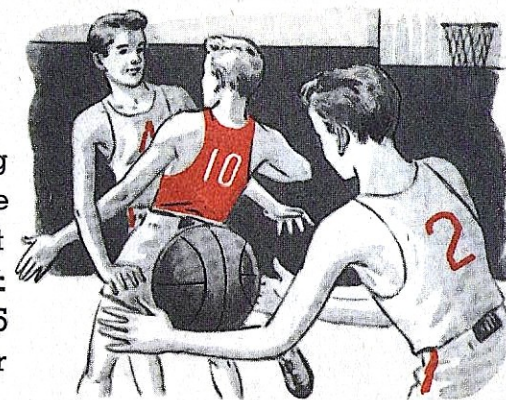
10. \$800 at 6% for 40 days

11. \$1200 at 5% for 9 days

12. \$3000 at 3% for 45 days

Passing the Ball

Some money-lending institutions do not use 360 days as an interest year. They find **exact interest** by using 365 days as the exact number of days in a year.



1. Find the exact interest on \$300 at 6% from March 13 to July 15.

The exact number of days from March 13 to July 15 = 124 days. (See p. 91)

$$\cancel{3} \$300 \times \frac{6}{\cancel{100}} \times \frac{124}{365} = \$\frac{2232}{365} = \$6.12$$

Find the exact interest on:

2. \$400 for 73 days at 5%

3. \$100 for 200 days at 6%

4. \$200 at 3% for 285 da.

5. \$500 at 6% from April 9 to Oct. 12

6. \$800 at 4% from June 18 to Nov. 6

7. \$1200 at 2% from Jan. 4 to Aug. 18

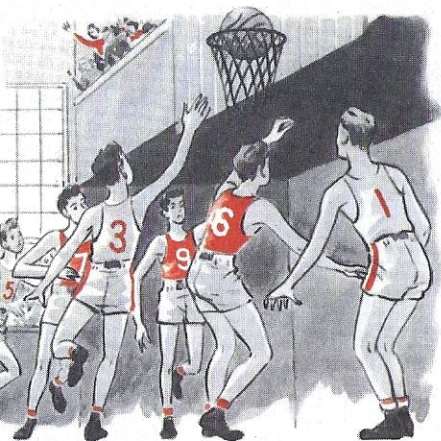
8. \$7000 at 5% from Jan. 2 to Feb. 24

9. \$4500 at 3% from May 15 to Dec. 9

10. \$12000 at 5% from June 11 to Jan. 31

11. \$5000 at 3% from March 1 to Feb. 26

After you have worked this page, help pupils now working page 102 so that they, too, will be able to find exact interest.



Goal for Unit Four

Ten right answers are your goal. If you have studied well, this is easy.

1. Jack needed a bicycle to deliver papers. His father lent him \$30 at 5% interest for 6 months. How much did he pay back after 6 months?

2. Mr. Jones borrowed \$500 from his bank at 6% interest for 90 days. How much did he owe the bank when the note matured?

3. Mr. Turner borrowed \$1000 at 6% on January 16, 1947, and paid it back March 28, 1947. How much did he have to pay including interest?

4. Mr. Wells bought a farm for \$6000, paying \$3000 cash. He agreed to pay 6% interest on the balance. At the end of one year he paid the interest on \$3000 and also paid \$500 of the principal. What was the interest? What was his total payment? What did he then owe?

5. When James Wilson was 8 years old, his father invested \$1000 at 4% compounded semi-annually. This was for James' college education. At the end of 10 years, how much did James have? Use the table, page 99.

6. What was the bank discount on \$1000 borrowed April 10 and repaid in 60 days at 6%? The proceeds? The date of maturity?



Unit Five

Saving and Investing

Why do you suppose so many persons cannot care for themselves in their old age? It is well known that only about five out of 100 people save enough to be able to quit work at 65 and live independently. If we should question the remaining 95, we should find that most of them made good salaries for many years, but that either they did not save enough money or they lost their savings through poor investments. If you want to be independent when you are old, it is important that you save regularly and invest wisely.

Budget Headings

Before any part of individual or family income is spent, a budget or plan for spending should be made. Items in a budget may vary according to amount of income, size of family, age of individuals, and locality, but in general all spending can be grouped under the following headings:

1. **Food:** Meals at home or away from home
2. **Shelter:** Rent, or taxes, insurance, and repairs if family owns home
3. **Operating expenses:** Heat, light, telephone, laundry, help, household supplies, and furnishings
4. **Clothing:** Clothes, shoes, dry cleaning, and sewing
5. **Transportation**
6. **Self-improvement:**
 - Health:* Doctor, dentist, and medicine
 - Church:* Church gifts and charities
 - Recreation:* Amusements, entertaining friends, and lodge or club dues
 - Education:* Books, magazines, newspapers, funds for education, lectures, and music lessons
 - Personal grooming:* Barber, hairdresser, and cosmetics
7. **Savings:** Bank accounts, life insurance, and other investments

Budgets for Families

Family Name	Allen	Mills	Burns
Weekly income	\$25.00	\$37.50	\$50.00
Headings	Amount Allowed per Week		
Food	\$8.00	\$9.60	\$12.00
Shelter	6.00	9.60	13.50
Operating	3.00	4.50	6.00
Clothing	3.00	3.90	5.00
Transportation	1.00	2.40	3.00
Self-improvement	1.50	3.60	4.00
Savings	2.50	3.90	6.50

1. The amount the Allens allow for food is what per cent of their weekly income?

$$\frac{8.00}{25} = .32 = 32\%$$

- 2. Find what per cent of their weekly income is allowed for each heading.

$$\begin{array}{r} 8.00 \\ 25 \overline{) 8.00} \\ 75 \\ \hline 50 \\ 50 \\ \hline \end{array}$$

- 3. Find what per cent of the weekly income is allowed for each budget heading by the Mills family; the Burns family.

- 4. Rewrite the table given at the top of the page and show the per cent, instead of the number of dollars, allowed for each heading.

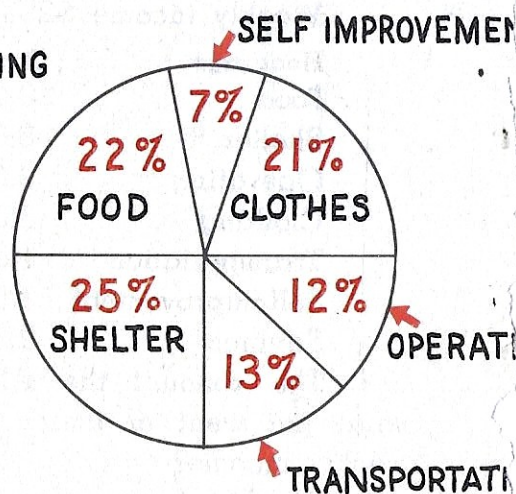
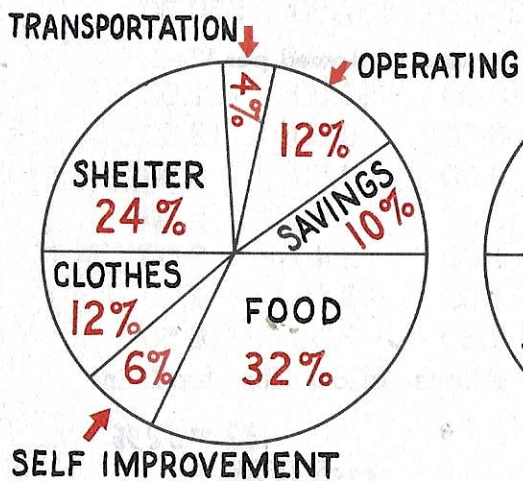
- 5! If a family had unexpected expenses, which headings do you think should be reduced?

- 6! If families are the same size and nearly of the same ages, will the amount spent for food double when the income doubles?

A Good and a Bad Budget

A Model Budget

The Smiths' Budget



1. What important heading is missing from the Smith family's budget? What are some of the serious difficulties that might result from following this budget plan?

2. Compare the amounts spent by the Smith family with the amounts given in the model budget. What kind of people do the Smiths seem to be?

3. What advice would you give Mr. and Mrs. Smith?

4. If the total yearly income of the Smith family is \$2,400, how much are they spending per year for each item?

5. According to the model budget, how much ought they be spending per item?

Helping the Smiths to Save

1. Explain the meaning of "thrift." What are some of the ways in which Mrs. Smith can use thrift in buying? How can Mr. Smith use thrift in driving his car?

2. What would Mrs. Smith save if she bought 6 pairs of socks for \$2.00 when the regular price was \$.40 a pair?

3. Mr. Smith drives a car that averages 12 miles per gallon of gasoline. If he drives 18,000 miles a year, what will he save by driving a car that averages 20 miles per gallon if gas costs \$.193 a gallon?

4. Mrs. Smith bought a coat marked \$54.00 at a discount of $33\frac{1}{3}\%$. What did she save?

5. A radio cost \$54.75 if bought on time payments. If a discount of 10% was given for cash, what did Mr. Smith save by paying cash?

6. A case of 100 bars of soap sells for \$6.25. In small amounts the soap sells at two bars for 15¢. What did Mrs. Smith save by getting a case of 100 bars?

7. What did the Smiths save by getting an order amounting to \$46.50 on which a 20% discount was allowed?

8. A \$150 living-room set could be bought by paying twelve monthly payments of \$16.50 each. What did Mrs. Smith save by paying cash?

Planned Spending for the Smith Family

1. Mr. Smith has a wife and two children. His income is \$40 per week. What is his income for one year of 52 weeks?

2. Mr. and Mrs. Smith decided to use the budget shown below. What per cent of their yearly income did they allow for each heading under expenditures?

Expenditures

Food.....	\$624.00
Clothing.....	\$260.00
(Father.....)	\$ 80.00)
(Mother.....)	\$100.00)
(Older child.....)	\$ 48.00)
(Younger child.....)	\$ 32.00)
Shelter.....	\$520.00
Operating expenses.....	\$260.00
Savings.....	\$208.00
Self-improvement.....	\$124.80
Transportation.....	\$ 83.20
Total	\$2080.00

3. Mr. and Mrs. Smith began to keep books by the month. The first page from their book is shown on page 111. What is the monthly allowance for each item? How was this found?

4. How is the "balance on hand" for each item found?

Household Account of Mr. and Mrs. Smith

February	Food	Clothing	Shelter	Savings	Operating	Others
Budget	\$52.00	\$21.66	\$43.33	\$17.33	\$21.66	\$17.33
1	2.87	.....	43.00	17.33	9.50	1.65
2	1.05	.....	.....	.....	.....	.25
3	.97	.75	.....	.....	.....	1.00
4	1.36	1.50	.....	.....	.95	.35
5	.74	.....	.....	.....	4.33	2.25
6	2.60	.....	.....	.....	.....	.....
7	.95	.....	.....	.....	.....	.....
8	1.34	.....	.....	.....	.....	.....
9	3.00	.....	.....	.....	2.85	1.75
10	.65	4.20	.....	.....	1.98	.25
11	.....	5.75	.....	.....	.....	.45
12	1.18	.....	.....	.....	.....	3.65
13	5.25	3.45	.....	.....	.....	.....
14	1.15	1.20	.....	.....	.....	.....
15	.65	.....	.....	.....	.....	.....
16	1.51	.....	.....	.....	.....	.25
17	.....	3.00	.....	.....	.....	.....
18	1.42	.....	.....	.....	.....	.....
19	1.95	.....	.....	.....	.....	.....
20	.85	.....	.....	.....	.....	.50
21	3.50	.....	.....	.....	.....	.75
22	2.25	.....	.....	.....	.....	.....
23	1.30	1.00	.....	.....	.....	.....
24	1.75	.35	.....	.....	.....	.....
25	2.00	.....	.....	.....	2.00	2.15
26	3.50	.....	.....	.....	.....	.....
27	2.12	.....	.....	.....	.....	.....
28	1.00	.....	.....	.....	.....	.....
Total	\$46.91	\$21.20	\$43.00	\$17.33	\$21.61	\$15.25
Budget	\$52.00	\$21.66	\$43.33	\$17.33	\$21.66	\$17.33
Balance on hand	\$ 5.09	\$.46	\$.33	\$.00	\$.05	\$ 2.08

Gaining Strength in Problem Solving

1. At \$30 a dozen, what is the cost of 15 linen napkins?

2. A burning candle is 8 inches long. At the end of 3 hours, it is 2 inches long. How much of the candle is burned per hour?

3. A burning candle is $7\frac{1}{2}$ inches long. After $3\frac{1}{2}$ hours, it is $4\frac{7}{8}$ inches long. How much of the candle is burned per hour?

4. A grocer bought $1\frac{1}{2}$ bushel 3 pecks of cherries at \$3.20 a bushel, and sold them at 18 cents a quart. What was his margin?

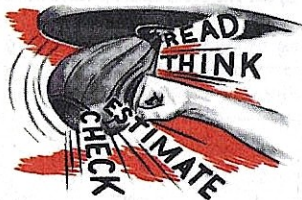
5. A city with a population of about 800,000 used about 216,000,000 gallons of water in one day. What was the average number of gallons per person?

6. Mr. Evans used 2.1 gallons of gasoline in driving 37.8 miles. How many miles was this per gallon of gasoline?

7. A toy balloon was blown 320 yards in 2 minutes 40 seconds. What was its speed in yards per second?

8. The map distance between two cities is $2\frac{1}{4}$ inches. The scale of the map is $1'' = 200$ mi. What is the actual distance between the cities?

9. Paving bricks are 4" by 8". How many of these bricks are needed for a walk 3' by 32'?



CURED MEAT	
SAUSAGE	
CANNED MEAT	

Pounds of Preserved Meats Used Last Year
(Each Small Picture Stands for 100,000,000 Pounds)

Practice in Reading Graphs

1. Write and then read the number of pounds of cured meat used last year; the number of pounds of sausage; the number of pounds of canned meats.

2. If the sausage had been divided evenly among 135,000,000 persons, how many pounds would each person have had?

Rounded numbers and graphs help us to see meanings in large numbers and to see relationships among large numbers.

3. In a recent year, 21,936,556 cows produced 11,508,243,769 gallons of milk. Round each of these numbers to the nearest million and find the average number of gallons of milk per cow.

4. In one year, 337,949,145 hens produced 2,391,091,513 dozen eggs. Round each of these numbers to the nearest hundred million and find the average number of dozen eggs a hen produced.

Investment of Savings

It is wise to put your savings to work to earn more money. When a person puts his money in a savings account, buys a farm or home, or lends his money for interest, he is investing his money, and the amount so placed is called an **investment**.

1. If you had \$7500, how would you invest it to earn more money?

It is important that people invest their money. If everyone who saves money were to hide it away, business firms and factories could not operate because few people have enough money to run such large businesses without borrowing money.

2. Is there a large business operating in the town where you live? What would happen if it closed?

3. What would happen if many large companies could not borrow the money necessary to run their business?

People should invest their money then for two reasons:

The business world must have money.

The person investing can increase his earnings.

4. What are some dangers in investing money?

5. Interview different members of your family and have them tell you how they have invested money. Have they taken any "risks"?

Choosing Investments

The kind of investment one makes depends on the purpose of the investment. An aged person or a widow who must live on the earnings must be sure that there is little chance of losing the money invested and that the income is certain. A man with a family and a small or medium salary will want protection for his family and will no doubt put his savings in a bank account or in insurance. A man who has much money does not have to be as careful. He can afford to take a chance on an investment which is not quite so safe but which has possibilities of large earnings. He knows he is taking a risk. Such investing is called **speculation**. *If you cannot afford to lose, do not speculate.*

Rules for a Good Investment Plan

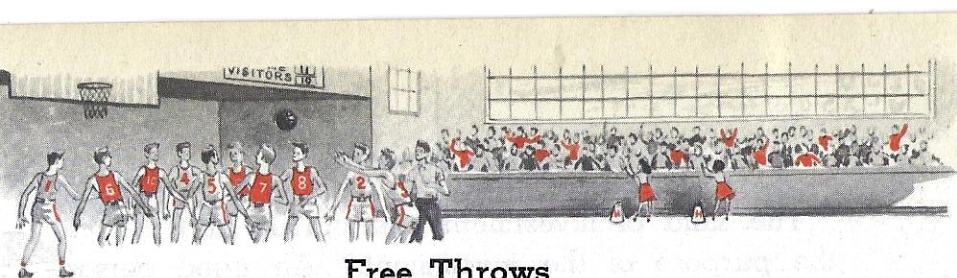
Safety: Are you reasonably sure that the money invested will not be lost?

Income: Will the earnings be regular?

Rate of Earnings: Are you earning as much on this investment as you could elsewhere with equal safety?

Marketability: Can you easily obtain the full amount of the investment in cash?

Spread: Do you have several kinds of investments so that if one fails only part of your savings will be lost?



Free Throws

You must make a perfect score on a throw to make the throw count a point. There is a chance for three points on this page.

First Throw:

- | 1. Add: | Subtract: | Multiply: | Divide: |
|------------|-------------|------------|---------------------------|
| 786 | 2. 8783 | 4. 9076 | 6. $8\overline{)9784}$ |
| 34 | <u>887</u> | <u>83</u> | |
| 974 | | | |
| 8 | 3. 2005 | 5. 7742 | 7. $37\overline{)11396}$ |
| 623 | <u>1096</u> | <u>307</u> | |
| 75 | | | 8. $192\overline{)14016}$ |
| <u>342</u> | | | |

Second Throw:

Find each answer in best form.

- | | | |
|---------------------------------------|--|--------------------------------------|
| 9. $\frac{3}{4} + \frac{5}{8}$ | 10. $3\frac{1}{3} + 2\frac{1}{2}$ | 11. $6\frac{3}{4} + 7\frac{1}{2}$ |
| 12. $16\frac{2}{3} - 6\frac{1}{4}$ | 13. $\frac{7}{8} - \frac{5}{16}$ | 14. $8\frac{1}{3} - \frac{3}{5}$ |
| 15. $4\frac{1}{2} \times \frac{1}{3}$ | 16. $8\frac{1}{3} \times 2\frac{2}{5}$ | 17. $\frac{7}{8} \times \frac{4}{5}$ |
| 18. $20 \div 2\frac{1}{2}$ | 19. $1\frac{5}{6} \div \frac{2}{3}$ | 20. $7\frac{1}{2} \div 1\frac{1}{4}$ |

Third Throw:

Find each answer.

- | | |
|-----------------------------|------------------------|
| 21. $3.8 + 6.7 + 9.0 + 4.2$ | 25. 7.73×8.38 |
| 22. $17.5504 - 6.6035$ | 26. $2.079 \div 2.700$ |
| 23. $.175 + .034 + .35$ | 27. 3.1416×90 |
| 24. $256.38 - 89.675$ | 28. $2.718 \div .18$ |



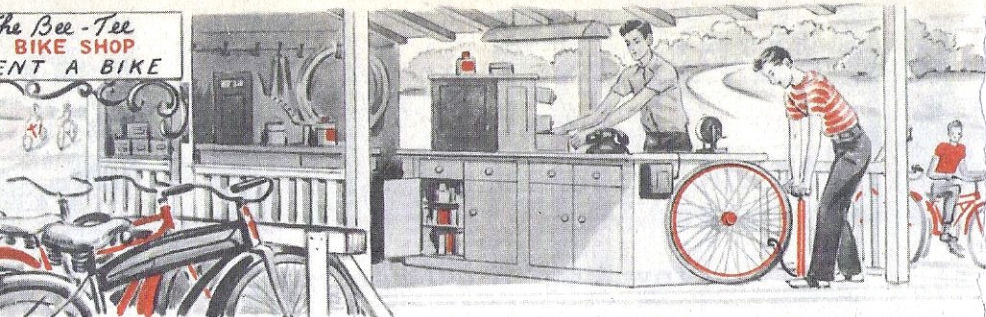
Investing in a Partnership

Bill was a good bicycle mechanic, and many boys brought bicycles to him to repair. Soon he had more work than he could do and he decided to open a shop and take Tom as a partner. Tom agreed and a **partnership** was formed. A *partnership is formed when two or more persons contract to conduct a business jointly and share the profits or losses.*

1. Bill and Tom figured that they needed about \$100 in the bank to pay rent for the shop and to buy paint, brushes, and parts. Bill gave \$75 toward the \$100 and Tom gave \$25. What fractional part of the business did each own?

2. At the end of the first year the partnership showed a profit of \$400. The partners divided this in proportion to the amount each had given toward the \$100 investment. How much did each get?

3. At the end of the second year there was a profit of \$520. The boys decided to put \$200 of this into used bicycles which they could rent to boys who did not own any, and divide the remaining profits between themselves. How much did each receive?



Forming a Corporation

1. After five years had passed, Bill and Tom had a prosperous "rent-a-bike" and repair shop. They took inventory and found they had \$36.50 in bicycle tires, \$50.90 in parts for repairs, \$46.75 in paints and painting equipment, \$875 in bicycles for rentals, and \$490.85 in the bank. What was the value, or **capital**, of the business?

Bill's and Tom's brothers and friends who helped them in the shop wanted to buy shares in the business. Bill and Tom decided to change the partnership into a **corporation** and sell **shares** to the other boys.

2. The inventory showed that the business had a capital of \$1500. If this amount was divided into 100 equal shares, what would be the value of each share?

3. Tom's brother Don bought 5 shares. How much did he pay for his shares, or **stock**? What part of the company did he own?

4. Bill kept 25 shares. What was the value of his stock? What part of the company did he own?

Each boy who bought one or more shares of stock became a **stockholder**, or part owner in the corporation. The stockholders met and voted to call the corporation the Bee-Tee Bike Shop, Inc. They elected five boys as a **board of directors** to direct the business.

The board of directors had **certificates** of stock printed and issued one to each boy holding stock in the corporation.

Certificate of Stock	
The Bee-Tee Bike Shop, Incorporated	
<i>This certifies that Don Scott is the</i>	
<i>owner of five fully-paid shares of the</i>	
<i>Capital Stock of the Bee-Tee Bike Shop, Inc.</i>	
<i>Bill Jones President</i>	
<i>Tom Scott Secretary</i>	
<i>Capital Stock \$1500</i>	<i>Total issue 100</i>
<i>Par Value \$15</i>	<i>shares</i>
<i>Transferable only on the books of the company by</i>	
<i>the owner in person.</i>	
<i>Date Jan. 1, 1948</i>	<i>Parkview, Indiana</i>

5. Tom owned 20 shares in the corporation. What part of it did he own? What did he pay for his stock at \$15 per share?

6. Write a stock certificate for Tom.

Dividing the Profits

Par value is the face value, or the value per share stated on the stock certificate. Stock may be sold above or below par.

1. Jerry held 23 shares of stock in the Bee-Tee Bike Shop, Inc. He was going away to college and needed money. He sold his stock at \$.75 below par. What was the selling price of one share? What did he get for his stock?

2. Jim wanted to buy stock in the shop. Bill Jones sold him 3 shares at \$5 per share above par. What did Jim pay per share? What did he pay for 3 shares?

3. At the end of the year the boys found that the corporation had made a profit of \$900. What was the profit per share?
Explain the work at the right.

$$\begin{array}{r} \$9 \\ 100 \overline{) \$900} \\ \underline{900} \end{array}$$

This profit was distributed among the stockholders. Such earnings, or profit, are called **dividends**.

4. Find the dividends on Jim's shares; on Tom's; on Don's.

5. Find the rate of dividend on each share.

This means to find what per cent \$9, the dividend, is of \$15, the par value.

6. If a share of this stock earned a dividend of \$.90, what would be the rate of dividend?

Problems About Stocks

The dollar sign is usually omitted in quoting the prices of stocks.

1. Ann bought ten shares of stock in the Plainview Sweet Shop at $3\frac{1}{2}$ above par. If par was 5, what did her stock cost?

2. Stock in the Krunchy Potato Chip Co. was selling at $5\frac{3}{4}$ below par. If par was 25, what was the selling price of 20 shares? 100 shares? 40 shares?

3. The capital stock of the Cool Breeze Fan Co. is \$45,000. What is the par value of a share of stock if the capital is divided into 15,000 equal shares?

4. One year the Cool Breeze Fan Co. distributed a dividend of \$3,000. What was the dividend per share?

5. The Snowwhite Laundry Co. paid a dividend of \$2.50 on stock having a par value of 50. What was the rate of dividend?

6. The Pure Gold Orange Juice Company paid a 3% dividend on stock having a par value of 100. What was the dividend per share?

7. Mr. Smith owned 150 shares of stock having a par value of \$50 per share. The company declared a 6% dividend. How much did Mr. Smith receive?

Stocks in Big Business

Frequently men in business raise money by forming a **corporation** or **stock company** just as the Bee-Tee Bike Shop did. To do this they sell shares in the ownership of the company to a number of people. **Units of ownership** or shares have a **face value** called par value as you have already learned. Par value may differ in different companies or for different kinds of stock. Sometimes it is \$1, \$5, \$50, or \$100, but it may be any amount. In some companies, a share stands only for ownership of a definite part of the company, and no par value is given to it.

1. The par value of the capital stock of the Quick Cook Gas Co. is \$75,000, and there are 15,000 shares in all. What is the par value of one share?

2. Ann bought ten shares of stock in the Plainview Sweet Shop at $3\frac{1}{2}$ per share. What did she pay for this stock?

3. Mr. Ames bought 25 shares of stock at 105 per share. What did he pay for the 25 shares?

A corporation does business as if it were a person. It must obtain a **charter** from the state in which it is incorporated. The stockholders elect a **board of directors**. This board issues **stock certificates** and is responsible for the management of the business.

4. Why do states require corporations to have a charter?

5. If a corporation was making a large profit, would the stock be likely to sell above par or below par?

6. Can you think of anything that might cause stock to sell below par?

7. Jerry bought 25 shares in the Wizard Electric Co. at $5\frac{1}{2}$ above par. If par for this stock is 100, what did he pay for the 25 shares?

8. Stock in the Krunchy Potato Chip Co. was selling at $4\frac{1}{4}$ below par. If par was 50, what was the selling price of 20 shares? 100 shares? 40 shares?

Corporations frequently divide part of the profits or earnings of the company among the stockholders. Earnings paid to stockholders are called **dividends**.

9. The Krunchy Potato Chip Co. distributed a dividend of \$3000 equally among 15,000 shares of stock. What was the dividend on each share?

10. Last year the Snowwhite Laundry declared a 4% dividend on each share of stock having a par value of 50. What was the dividend per share? On 150 shares?

Find the yearly dividend on each share.

	11.	12.	13.	14.	15.
Par Value	\$50	\$20	\$15	\$75	\$100
Dividend Rate	6%	8%	4%	9%	3%

Paying the Broker

Stock is usually bought and sold through persons called **brokers**. The fee they charge for buying and selling stock for their customers is called **brokerage**. Brokerage fees may be quoted as **parts of a dollar** as $\frac{1}{8}$, meaning $\$ \frac{1}{8}$, or in **cents** as given in the table below.

Brokers must meet regularly to buy and sell. An organization for this purpose is called a **stock exchange**. There are stock exchanges in many cities, but the largest in the world is the New York Stock Exchange in New York City. The following table shows the brokerage fees charged per share on the New York Stock Exchange.

Cost per Share	Less than \$10	\$10 to \$24 $\frac{7}{8}$	\$25 to \$49 $\frac{7}{8}$	\$50 to \$74 $\frac{7}{8}$	\$75 to \$99 $\frac{7}{8}$	\$100 to \$199 $\frac{7}{8}$
Brokerage per Share	7 $\frac{1}{2}$ ¢	12 $\frac{1}{2}$ ¢	15¢	17 $\frac{1}{2}$ ¢	20¢	25¢

Different brokerage fees may be charged, but we shall use the ones given above.

1. How much brokerage must you pay if you buy 100 shares of stock at \$85 a share?

2. Find the brokerage on 25 shares of stock costing \$25 a share.

When stock is bought, the brokerage is added

to the cost of the stock and the customer must pay the sum or **total cost**.

3. Find the cost including brokerage on 100 shares of American Can at $\$140\frac{1}{2}$ a share.

Market price + brokerage fee = Total cost

$$100 \text{ shares at } \$140\frac{1}{2} = \$14,050 \quad \text{Market Price}$$

$$100 \text{ shares at } 25¢ = \$25 \quad \text{Brokerage Fee}$$

$$\$14,050 + \$25 = \$14,075 \quad \text{Total Cost}$$

Find the cost including brokerage:

4. 200 sh. of American Cable at $\$30\frac{1}{2}$ per share.

5. 600 sh. of General Electric at \$50 per share.

6. 90 sh. United Fruit at $\$185\frac{1}{4}$ per share.

7. 300 sh. Eastman at $\$155\frac{1}{8}$ per share.

When stock is sold, the brokerage is subtracted from the selling price and the customer receives the remainder or the **net proceeds**.

8. Find the net proceeds from the sale of 300 sh. of U. S. Leather at $\$13\frac{1}{4}$ per share.

Market price - brokerage fee = Net proceeds

$$300 \text{ sh. at } \$13\frac{1}{4} = \$3975 \quad \text{Market Price}$$

$$300 \text{ sh. at } 12\frac{1}{2}¢ = \$37.50 \quad \text{Brokerage Fee}$$

$$\$3975 - \$37.50 = \$3937.50 \quad \text{Net Proceeds}$$

Find the net proceeds from the sale of:

9. 600 sh. General Electric at $\$62\frac{1}{2}$ a share.

10. 400 sh. of Chrysler at $\$101\frac{7}{8}$ per share.

11. 250 sh. of RKO at $\$26\frac{1}{2}$ per share.

Reading a Stock Market Report

Large newspapers publish daily **stock market reports** of the buying and selling done on the New York Stock Exchange. Stock market reports usually give the following information about important stocks for a particular day.

Sales: number of shares sold

High: highest selling price per share

Low: lowest selling price per share

Close: price per share at end of the day

Stock	Sales (00 omitted)	High	Low	Close
Am. Can	264	67 $\frac{7}{8}$	66 $\frac{3}{4}$	67 $\frac{3}{4}$
Case, J. I. Co.	9	50 $\frac{1}{8}$	47 $\frac{7}{8}$	50
Chrysler	70	109	109	109
Gen. Electric	53	33 $\frac{3}{8}$	33 $\frac{1}{4}$	33 $\frac{1}{4}$
Gen. Motors	55	54	52 $\frac{7}{8}$	53 $\frac{1}{2}$
Gen. Motors Pf5	78	126 $\frac{1}{2}$	126	126
U. S. Steel	162	68 $\frac{1}{8}$	66 $\frac{3}{4}$	67

1. How many shares of U. S. Steel were sold on the day reported above?

2. Mr. Hill bought 40 shares of U. S. Steel at \$66 $\frac{3}{4}$ (66 $\frac{3}{4}$). What did he pay for the stock including brokerage? Use brokerage rates given on page 124.

3. What would the stock have cost if Mr. Hill had bought it at the high shown in the market report on page 126?

Refer to the market report on page 126 and answer the following:

4. Of which stock were the greatest number of shares sold?

5. Which stock did not change in price?

6. Which stock had the widest change?

7. Bring the New York Stock Market report from a daily newspaper to school. Find the stocks quoted here. How do your quotations compare with those given here?

Ordinary stock in a company is called **common stock**. Sometimes, but not always, a company also issues **preferred stock**. Usually preferred stock receives dividends at a set rate, and these dividends must be paid even if not enough money is left to pay dividends on common stock. If a company fails, preferred stockholders get first claim on any money or property that belonged to the corporation.

8. Find a preferred stock in the report on page 126. How can you tell it is preferred? What set rate of dividend does it pay? How do you know?

9. Find several preferred stocks in the market report that you brought to school. What rate of dividend does each pay?

Rate of Earning on Stock Investments

Dividends are paid on the par value of preferred stocks.

Par value $\times$ rate of dividend = dividend

Find the dividends on the following:

1. Par value, \$100; dividend rate, 4%.
2. Par value, \$50; dividend rate, $3\frac{1}{2}\%$.

To find the rate of income on a stock investment, a stockholder must compare the earnings per share with the price he paid for a share.

Dividend $\div$ price per share = rate of income

3. Find the rate of income on 5% stock, par value \$100, bought at \$125 per share.

Income	Rate of Income
<i>5% of \$100 = \$5.00</i>	<i>.04 = 4%</i>
	$\begin{array}{r} \$125 \overline{) \$5.00} \\ \underline{500} \end{array}$

4. What would the rate of income have been if the stock in example 3 had been bought at \$200 a share? At \$80? At \$50? At \$150?

Find the rate of income on:

	Par Value	Purchase Price	Dividend Rate
5.	\$100	\$60	3%
6.	\$ 50	\$75	6%
7.	\$ 25	\$50	4%
8.	\$100	\$80	6%

128

The Tip-Off

1. Mr. Ames earns \$3000 a year. What per cent of his salary does he spend for clothes if his clothing bill is \$500 for one year? $\frac{1}{6}$ 3 3

2. How much does Mrs. Hill spend weekly for food if the family's weekly income is \$48, and she allows $\frac{1}{3}$ of it for food?

3. What will 200 shares of stock cost at $102\frac{1}{2}$ a share, brokerage 25¢?

4. Mr. Hill sold 150 shares of stock at $135\frac{1}{2}$ per share. What are the proceeds of the sale if he paid 25¢ for brokerage?

5. Find the dividend on a share of 3% stock, par value \$100.

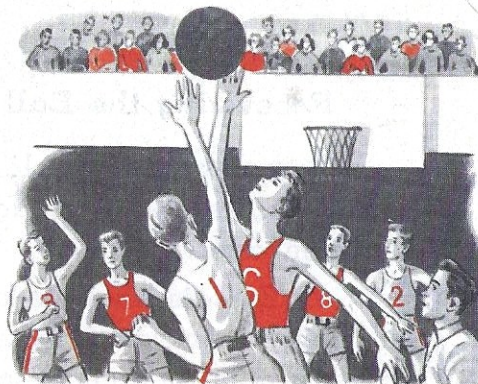
6. Find the dividend on 200 shares of 6% stock having a par value of \$100.

7. What is the rate of income on 4% stock, par value \$50, bought at \$25?

8. Ohio Oil stock was $22\frac{7}{8}$ at the opening of the New York Stock Exchange and $24\frac{1}{4}$ at the close. How much did the stock rise that day?

If you had 7 right answers, work page 131. Others will find help on page 130.

129



Recovering the Ball

If you cannot explain a term, refer to the page given after it.

1. Explain what the following terms mean when used with reference to corporations and stocks: shares (118), broker (124), corporation (118, 122), stockholder (119), par (120), New York Stock Exchange (124), dividends (120, 128), market report (126), preferred stock (127), market price (125), brokerage (124), total cost (125), net proceeds (125), income on investment (128).

Find the total cost of buying these stocks:

No. of Shares	Market Price	Brokerage
2. 200	$135\frac{1}{4}$	25¢
3. 100	9	$7\frac{1}{2}$ ¢
4. 500	24	$\frac{1}{8}$

Find the net proceeds of these stock sales:

No. of Shares	Market Price	Brokerage
5. 120	21	$\frac{1}{8}$
6. 1000	$175\frac{1}{2}$	$\frac{1}{4}$
7. 700	68	$17\frac{1}{2}$ ¢
8. 300	$137\frac{5}{8}$	25¢

9. What will your rate of income be if you buy 7% preferred stock having a par value of \$100 at \$200 a share?



Passing the Ball

Help a group of three or four pupils who are now working p. 130. To be a good helper you may have to work p. 130 before offering your assistance.

1. What is the cost of 75 shares of stock bought at $89\frac{1}{2}$, brokerage 20¢ a share?

2. What are the net proceeds of the sale of 75 shares of stock at $89\frac{1}{2}$, brokerage 20¢ a share?

3. Mr. Hill bought 100 shares of Freeport Sulphur at $64\frac{7}{8}$, brokerage $17\frac{1}{2}$ ¢ a share. He sold this stock a week later at $73\frac{1}{2}$, brokerage $17\frac{1}{2}$ ¢ a share. What was his profit?

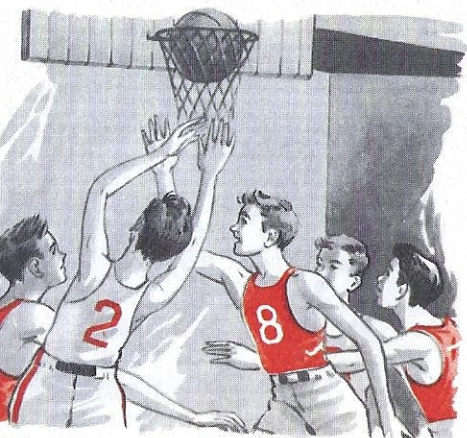
4. Mr. Hill bought Western Transit at $9\frac{1}{4}$, brokerage $\frac{1}{8}$. He was forced to sell it the next day at $5\frac{1}{2}$ a share, brokerage $12\frac{1}{2}$ ¢. What was his loss on 200 shares?

5. Can you think of any reason that might cause Mr. Hill to sell at such a great loss?

6. Which will pay the larger dividend, 500 shares of 6% stock with a par value of \$50, or 500 shares of 4% stock with a par value of \$75?

7. Which investment gives the better rate of income, 4% preferred stock, par 50, bought at 40, or 6% preferred, par 100, bought at 120?





Goal for Unit Five

1. Mr. Jones bought 100 shares of Superior Oil at 110, brokerage 25¢. What did he pay for the stock?

2. Find the cost of 200 shares of General Ca-

ble at $14\frac{1}{2}$, brokerage $12\frac{1}{2}$ ¢.

3. Mr. Jones sold 50 shares of Swift and Company stock at $33\frac{1}{4}$, brokerage 20¢ a share. What were the net proceeds of this sale?

4. How much will Mr. Hill receive if he sells 200 shares of General Cable at $13\frac{1}{2}$, brokerage $12\frac{1}{2}$ ¢?

5. What is the dividend on a share of 5% preferred, par value of \$75?

6. Find the dividend on 200 shares of 3% preferred, par value of \$100.

7. What is the rate of income on 4% preferred bought at \$80 if the par value is \$100?

8. Mr. West earns \$3600 a year. He has a budget which allows 12% of his earnings for savings. This year he will be able to save 3% more than the rate allowed in his budget. How many dollars will he save this year?

9. Mr. Jones paid \$8000 for 100 shares of 6% preferred, par \$100 a share. What was his yearly rate of income from this investment?



Government Bonds

When governments need more money than can be raised from taxes, they borrow the money and give their **bonds** as security. That is, the government prints bonds, and these in turn are sold by banks and brokers to persons or groups wishing to invest money. *A bond is a promissory note issued to the one from whom the money is borrowed.* The bond has a **face value**, a **set rate of interest**, and a certain **date when it matures**, or becomes due.

Government Bonds as an Investment

The United States, state, and local governments, such as counties, cities, and school districts, often obtain money for public improvements by issuing bonds. The purchaser of a bond is really lending money to the government. The government pays the interest on the face value of the bond until it becomes due. Bonds run for a long time, usually from 4 to 40 years. When the bond matures, the holder is paid the face value of the bond by the government making the issue.

Government bonds are a safe investment because the pledge of a city, state, or nation is behind them. The safest and therefore the best bonds in which to invest are United States Government bonds. Many city, state, and county bonds are also excellent investments.

1. The citizens of Plato City voted a bond issue of \$1,250,000 to improve their school buildings. If the bonds were to run for 20 years, how much interest would they pay during that time if the rate of interest was 4%?

2. If the face value of each school bond issued was \$1,000, how many bonds were issued to obtain the \$1,250,000 loan?

3. The Plato City school bonds were issued January 1, 1949. On what date will these bonds mature?

When bonds become due they are redeemed at par value.

Par value is the face value of a bond. The price of a bond depends on several things, such as security behind it, the interest rate it bears, and the length of time until the bond matures. Bonds selling for more than par are said to sell at a **premium**. Those selling below par are said to sell at a discount.

4. Mr. Smith bought a \$1000 Plato City school bond at par. His broker charged \$2.50 brokerage fee. How much was the total cost of the bond?

$$\text{Cost} + \text{brokerage} = \text{total cost}$$

5. Mr. West bought a bond quoted at $97\frac{1}{2}$. What was the total cost of the bond if the brokerage was \$2.50 a thousand and the face of the bond was \$1000?

Work:

The quotation $97\frac{1}{2}$ means $97\frac{1}{2}\%$ of face value

$$97\frac{1}{2}\% \text{ or } .975 \times \$1000 = \$975 \text{ cost of bond}$$

$$\$975 + \$2.50 \text{ brokerage} = \$977.50 \text{ total cost}$$

6. Find the cost of a \$1000 bond quoted at $94\frac{1}{2}$, brokerage \$2.50 per thousand; of a \$5000 bond at the same quotation.

7. What will Mr. Jones pay for a \$500 bond quoted at 105, brokerage \$1.50? What would he pay for the bond if it were quoted at $103\frac{5}{8}$?

Marketing Bonds

Nearly every large city has a market where bonds are bought and sold. The New York Bond Market quotations are printed in many daily newspapers.

Find the market value of a \$5000 bond at each of the following quotations:

1. 95 3. 105 5. 110 7. 83
 ✓2. $91\frac{1}{4}$ ✓4. $78\frac{1}{2}$ ✓6. $101\frac{1}{2}$ ✓8. $104\frac{7}{8}$ 875

9. Find the total cost of a \$10,000 bond at each quotation given above, brokerage, \$2.50 per \$1000.

✓10. Find the proceeds from the sale of a \$2500 bond at each quotation given above, after paying \$2.50 brokerage per \$1000.

Selling price - brokerage = net proceeds

11. Which of the above quotations show that the bond is selling at a premium? At a discount?

✓12. Mr. Jones bought a \$500 bond at 89. $\frac{1}{4}$ What was the total cost of the bond if the brokerage was $\frac{1}{4}$ ($\frac{1}{4}$ means 25¢ per \$100)?

13. Mr. Dow sold a \$1500 bond at 105, paying $\frac{1}{8}\%$ brokerage. What were the proceeds of the sale?

✓14. How much will be received for a \$20,000 bond at $102\frac{1}{2}$ after deducting \$2.50 per \$1000 for broker's commission?

Collecting Interest from Bonds

Registered bonds: Some bonds are registered in the name of the owner on the books of the agency issuing the bond. At the end of each interest period the interest due is mailed to the owner of the bond.

1. Mr. Barr owns \$5000 worth of 4% registered bonds. If interest is paid every 6 months, what will be the amount of the check he receives at the end of each interest period?

2. What are some of the advantages of registered bonds?

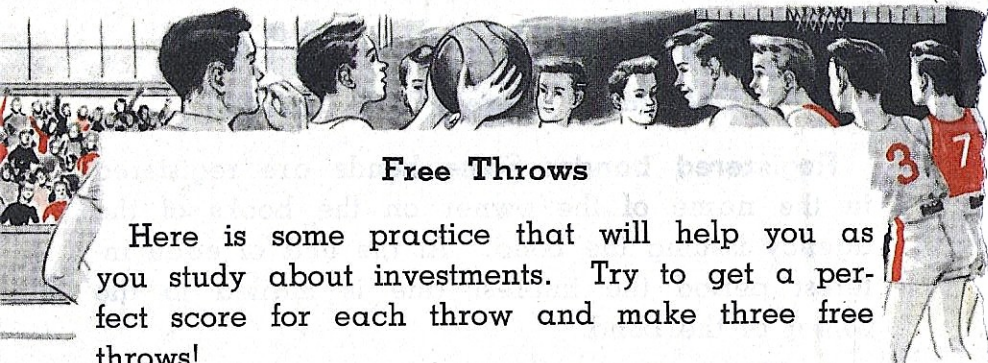
Coupon bonds: Many bonds bear coupons representing the interest due the holder. Each coupon is dated and gives the amount of interest due for that particular interest period.

3. How many coupons will a 20-year bond bear if interest is paid annually? Semi-annually? Quarterly?

4. What will be the amount of each coupon on a \$5000 bond, bearing interest at 5%, if the interest is paid annually?

5. What will be the amount of each coupon on a \$10,000 bond, bearing 4%, if the interest is paid semi-annually?





Free Throws

Here is some practice that will help you as you study about investments. Try to get a perfect score for each throw and make three free throws!

First Throw: Find the part.

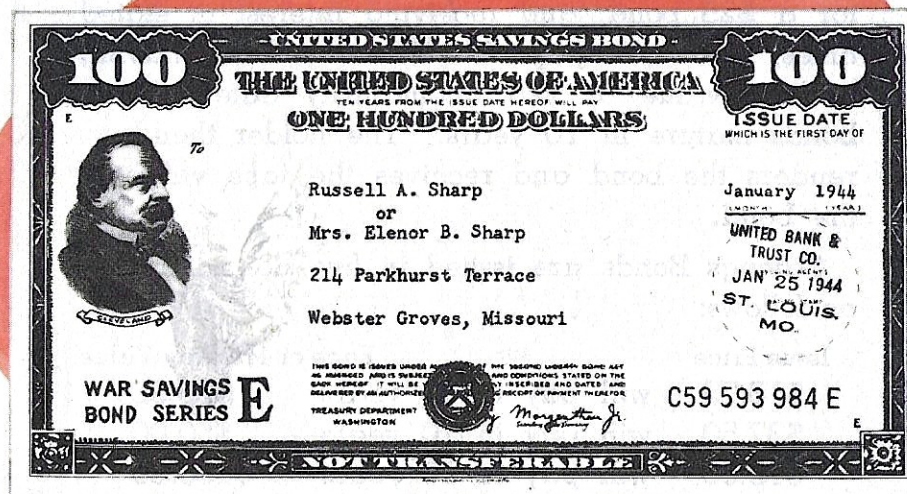
- | | |
|---------------------------------|------------------------------|
| 1. 4.2% of \$600 | 102% of \$6,000 |
| 2. $3\frac{1}{2}\%$ of \$8,000 | $81\frac{7}{8}\%$ of \$4,000 |
| 3. 3.75% of \$45,000 | 120% of \$300 |
| 4. $4\frac{1}{4}\%$ of \$20,000 | 75% of \$7,000 |
| 5. 94% of \$700 | 1.3% of \$20,000 |
| 6. $\frac{1}{2}\%$ of \$10,000 | $93\frac{1}{2}\%$ of \$5,000 |

Second Throw: Find the per cent. Carry to the nearest tenth of a per cent.

- | | |
|-------------------------|------------------------|
| 7. \$5 is ___% of \$500 | Compare \$25 with \$50 |
| 8. \$6 is ___% of \$210 | Compare 125 with 750 |
| 9. 5 is ___% of 105 | Compare 4 with 80 |
| 10. 3 is ___% of 75 | Compare 10 with 250 |
| 11. 3 is ___% of 90 | Compare 75 with 1040 |
| 12. 4 is ___% of 102 | Compare 6 with 200 |

Third Throw: Find the whole.

- | | |
|-------------------------------------|-------------------------------|
| 13. \$3.40 is 4% of ___ | \$408 = 102% of ___ |
| 14. \$12 is 2.5% of ___ | \$510 = 2% of ___ |
| 15. 3.75 is $3\frac{3}{4}\%$ of ___ | 1900 = 95% of ___ |
| 16. 315 is 7% of ___ | 450 = $2\frac{1}{4}\%$ of ___ |
| 17. 42 is 2.1% of ___ | 70 = 3.5% of ___ |
| 18. \$18 is .3% of ___ | 85 = 5% of ___ |



United States Savings Bonds

Each year the United States Government borrows large amounts of money by selling **United States Savings Bonds**. Millions of persons in the United States own the Series E form of these bonds like the one shown above. There is no simpler nor safer investment in the world. Any person can buy one for cash at any bank or any first, second, third, and some fourth class post offices. No brokerage is charged.

Investing in United States Savings Bonds

United States Savings Bonds are sold on a discount basis. For example, instead of paying \$25 for a \$25 bond, and receiving interest at stated times, the buyer pays \$18.75 for a bond having a face value of \$25 at maturity date. These bonds mature in 10 years. The holder then surrenders the bond and receives the face value of the bond.

Savings Bonds are issued in five denominations as follows:

Issue Price		Face or Maturity Value
\$18.75	will pay in 10 years	\$25.00
\$37.50	will pay in 10 years	\$50.00
\$75.00	will pay in 10 years	\$100.00
\$375.00	will pay in 10 years	\$500.00
\$750.00	will pay in 10 years	\$1000.00

1. Mr. Dow bought a \$1000 bond and held it to maturity. How much interest did he get on his investment? What per cent of the cost of the bond was his interest?

2. Check and find out if the interest on each bond quoted above is $33\frac{1}{3}\%$ of the cost of the bond. At this rate, what is the average yearly interest rate on each bond which is held by the purchaser to maturity?

The actual rate of interest on these bonds compounded semi-annually is 2.9%.

3. How much must be invested to get bonds with a maturity value of \$1000? \$5000?

4. If a person invested \$18.75 each month in a savings bond for a period of 10 years, what would his monthly income from these bonds be for the following 10 years?

United States Savings Bonds can be bought at any time and may be cashed at any time after sixty days from date of issue. Each bond has a table of redemption values printed on the back of the bond, as below:

Cost.....	\$18.75	\$37.50	\$75.00	\$375.00	\$750.00
Redemption Values After Date of Issue					
1st yr.....	\$18.87	\$37.75	\$75.50	\$377.50	\$755.00
2nd yr.....	\$19.12	\$38.25	\$76.50	\$382.50	\$765.00
3rd yr.....	\$19.50	\$39.00	\$78.00	\$390.00	\$780.00
4th yr.....	\$20.00	\$40.00	\$80.00	\$400.00	\$800.00
5th yr.....	\$20.50	\$41.00	\$82.00	\$410.00	\$820.00
6th yr.....	\$21.00	\$42.00	\$84.00	\$420.00	\$840.00
7th yr.....	\$22.00	\$44.00	\$88.00	\$440.00	\$880.00
8th yr.....	\$23.00	\$46.00	\$92.00	\$460.00	\$920.00
9th yr.....	\$24.00	\$48.00	\$96.00	\$480.00	\$960.00
10th yr.....	\$25.00	\$50.00	\$100.00	\$500.00	\$1000.00

5. Is it wise to have savings bonds pay higher earnings in the last 3 years? Why?

6. What will you receive if you cash \$10,000 in savings bonds at the end of their 7th year? Of their 8th year?

Gaining Strength in Problem Solving

These problems will test your ability to think well and compute accurately.



1. A candy store packed 72 pounds of peanut brittle in 12-ounce boxes. How many boxes were there?
2. Harold lives $\frac{3}{8}$ mile from school. How many miles does he walk in five days in going to school, in going home for lunch and returning to school, and in going home after school?
3. Sally walks $1\frac{7}{8}$ miles a day. How many days will it take her to walk 15 miles?
4. The butcher said a roast cost \$2.10. Mrs. Jones noticed that the scales showed the weight to be 4 lb. 6 oz. How much did the roast cost per pound?
5. Sandwich rolls sell at the rate of 3 for 10¢, and wieners sell at 5¢ each. A roll and a wiener make a sandwich. How many sandwiches can be made from rolls and wieners that can be bought for 25¢?
6. Jack has 24 pennies, $\frac{1}{8}$ as many nickels and $\frac{1}{6}$ as many dimes as pennies. How much money has he in all?
7. Mrs. Lee paid \$2.70 for $2\frac{1}{4}$ yards of material. At this rate, what is the cost per yard?

8. Gasoline costs $\$21\frac{1}{2}$ a gallon. Mr. Gray bought 8 gallons. How much change should he get back from a 10-dollar bill?

9. Edwin bought $\frac{3}{4}$ lb. of butter at the rate of 72 cents a pound and $3\frac{1}{2}$ lb. of meat at \$.56 a pound. What was the total cost?

10. The Drive-It-Yourself Cab Company charges at the rate of \$3 per hour and counts time correct to the nearest quarter hour. Find the cost for the use of an automobile from a quarter of nine in the morning till ten minutes after twelve, noon.

11. Mr. Day used $12\frac{1}{2}$ gallons of gasoline in driving $209\frac{3}{8}$ miles. What was the average number of miles per gallon of gasoline?

12. A taxicab driver charges \$.35 for a trip up to $1\frac{3}{4}$ miles, and 5 cents extra for each additional $\frac{1}{4}$ mile. What is the cost of a trip of $4\frac{1}{2}$ miles?

13. Harry bought a suit at a sale for \$30. The sale price was $\frac{2}{5}$ less than the regular price. What was the regular price?

14. A kite string broke so that $\frac{3}{8}$ of it was left in the boy's hand. The part the boy had left was 45 feet long. What was the total length of the kite string before it was broken?

15. The materials for a sandwich cost $8\frac{1}{3}$ cents. If the meat costs $1\frac{1}{2}$ times as much as the bread, how much does each cost?

Corporation Bonds

If a corporation needs more money than is raised from the sale of stocks, it borrows by issuing and selling bonds. These bonds, like government bonds, are promissory notes promising to pay a set rate of interest to the holder at given intervals and the face value at maturity. Bonds are usually secured by part or all of a company's property. The security behind a bond should be investigated before bonds are purchased.

1. Which seems the safest investment, common stock, preferred stock, or bonds of the same corporation?

Interest on bonds is paid before any interest is paid on preferred stock (p. 127). If a company fails to pay interest due on its bonds, any bondholder can ask the court to appoint a **receiver** to take over and run the company. If the company still fails to pay interest, bondholders can get a court order to have the company sold. The money from the sale can be used to pay bondholders the money they lent on the company's bonds.

2. Would a bondholder be likely to get back the face value of his bonds if a company were sold to satisfy bondholders? Explain your answer.

3. What is the market value of a bond quoted at $10\frac{1}{2}$ points above par? Find the market price of a \$500 bond at this rate.

Find the market value of a \$10,000 bond at:

4. $101\frac{3}{8}$ $83\frac{5}{8}$ 75 $107\frac{3}{4}$

5. $90\frac{1}{4}$ $101\frac{7}{8}$ $99\frac{1}{2}$ $87\frac{1}{4}$

6. Find the interest on a $4\frac{1}{2}\%$ railroad bond, face value \$4000, for 1 year; for 5 years; for 6 months; for 1 month.

If a bond is bought between interest dates, the buyer must pay the previous owner any interest due since the last interest paying date. Interest paying dates are usually every 6 months, as January 1 and July 1, or March 1 and September 1.

7. A \$2000 bond having interest paying dates of January 1 and July 1 is bought May 1. How much interest is due if the bond bears 6% interest?

Think: January 1 to May 1 = 4 months.

$$\frac{\overset{10}{\cancel{20}}}{1} \times \frac{\overset{1}{\cancel{6}}}{100} \times \frac{4}{\overset{12}{\cancel{2}}} = \$40 \text{ interest due}$$

8. Find the interest due on the bond above on: June 1; Oct. 1; Nov. 1; April 1; Feb. 1; Aug. 1.

9. Find the interest due on a 3% bond for \$5000, having interest dates of January 1 and July 1, if the bond is sold on dates given in Ex. 8.

10. Find the interest due on a 4% bond for \$10,000, interest dates January 1 and July 1, if the bond is sold on dates given in Ex. 8.

Total Cost Including Interest

1. A buyer bought bonds of \$2000 face value at 89, brokerage \$2.50 per \$1000. What was the total cost, including unpaid interest at 3%, if the bonds were bought May 1 and interest dates were January 1 and July 1?

$$\begin{array}{rcl}
 \text{Market value} & \$2000 \times .89 = & \$1780.00 \\
 \text{Brokerage} & \$2.50 \times 2 = & 5.00 \\
 \\
 \text{Interest due} & \$2000 \times \frac{20}{100} \times \frac{1}{12} \times \frac{4}{1} = & 20.00 \\
 \hline
 \text{Total cost} & & \$1805.00
 \end{array}$$

2. What would be the total cost if the bonds purchased in Problem 1 had a face value of \$9000 and bore $4\frac{1}{2}\%$ interest?

Find the total cost of bonds listed below. Interest dates are January 1 and July 1, brokerage \$2.50 per \$1000.

	Face	Market Value	Interest Rate	Date Purchased
3.	\$3000	85	5%	June 1
4.	\$7000	91 $\frac{1}{2}$	6%	Sept. 1
5.	\$3000	102 $\frac{1}{2}$	6%	Oct. 1
6.	\$5000	112	5%	Nov. 1
7.	\$1000	98	6%	April 1
8.	\$5000	87 $\frac{1}{2}$	4%	May 1
9.	\$6000	105	4%	June 1
10.	\$15,000	83	5%	Dec. 1

Net Proceeds Including Interest

1. Mr. Ames sold bonds having a face value of \$2000 at 89, paying \$2.50 brokerage per \$1000. What were the proceeds of the sale including unpaid interest at 3%, if the bonds were sold May 1 and interest dates were January 1 and July 1?

$$\begin{array}{rcl}
 \text{Market value} & \$2000 \times .89 = & \$1780.00 \\
 + \text{Interest due} & \$2000 \times \frac{3}{100} \times \frac{4}{12} = & 20.00 \\
 \hline
 \text{Selling price} & & \$1800.00 \\
 - \text{Brokerage} & \$2.50 \times 2 = & 5.00 \\
 \hline
 \text{Proceeds of sale} & & \$1795.00
 \end{array}$$

2. What would be the proceeds of the sale if the bonds sold in Problem 1 had a face value of \$1,000 and bore 6% interest?

Find the net proceeds from the sale of the bonds listed below after paying \$2.50 per \$1000 brokerage. Interest dates are January 1 and July 1.

	Face	Market Value	Interest Rate	Date Sold
3.	\$2000	102	4%	April 1
4.	\$5000	85 $\frac{1}{2}$	6%	August 1
5.	\$7000	101 $\frac{1}{4}$	5%	May 1
6.	\$10,000	105	6%	Dec. 1
7.	\$8000	99	5 $\frac{1}{2}\%$	Nov. 1

Finding Rate of Income on Bonds

1. Find the annual interest on Baldwin Elevator 6s (6% interest), face \$3000.

$$\text{Face} \times \text{Rate of interest} = \text{Interest}$$

Find the annual interest on the following:

2. Electric P.&L. 5s; face \$2000
3. Florida Fruit 4s; face \$1500
4. Oklahoma Nat. Gas 6s; face \$6000
5. Mr. Dale received \$6 annual interest from a \$100 bond bought at par. What was the annual rate of interest?

$$\text{Interest} \div \text{Face} = \text{Rate of interest on bond}$$

Find rate of interest on these bonds:

- | Face | Interest | Face | Interest |
|-----------|----------|----------|----------|
| 6. \$9000 | \$180 | 7. \$500 | \$20 |
| 8. \$1800 | \$45 | 9. \$600 | \$72 |
10. Mr. Dale (Problem 5) sold his bond to Mr. Ames for \$120. What rate of income will Mr. Ames make on this investment?

To find rate of income on money invested in bonds, *compare the earnings per year with the price paid for the bonds, or*

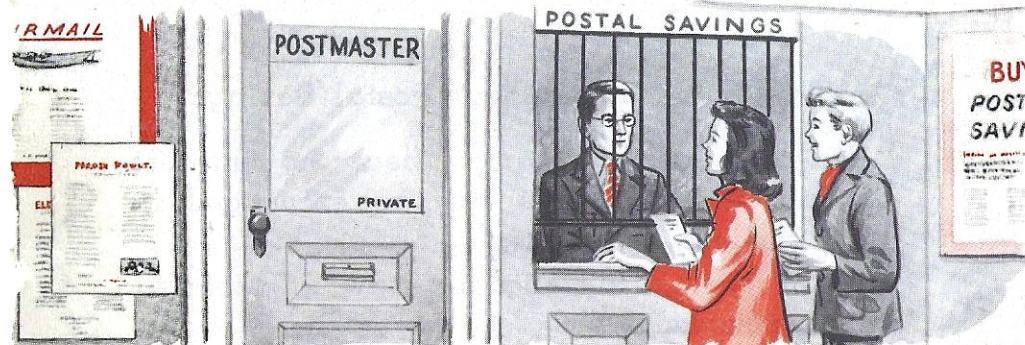
$$\text{Income} \div \text{Cost} = \text{Rate of income}$$

$$\$100 (\text{Face}) \times .06 (\text{Rate}) = \$6.00 \text{ Income}$$

$$\$6.00 \div \$120 = .05 = 5\% \text{ Rate of income}$$

Find rate of income on:

11. Face, \$100; cost, \$88; interest, 4%
12. Face, \$500; cost, \$600; interest, 6%
13. Face, \$400; cost, \$360; interest, $4\frac{1}{2}\%$



Postal Savings

In 1911 the United States Government established the Postal Savings System. Many families consider this the most convenient and safest way for them to save money.

Any person may open a postal savings account in his own name if he is 10 years of age or older. He may deposit and withdraw savings at any time.

Boys and girls like this plan because Postal Savings Stamps may be bought at 10¢ each. The purchaser pastes the stamps on a card furnished at the post office. When 10 stamps have been placed on the card, it can be exchanged for a \$1 Postal Savings Certificate.

Postal Savings Certificates are issued in denominations of \$1, \$2, \$5, \$10, \$20, \$50, \$100, \$200, and \$500. A person may buy as many of these certificates as he wishes, as long as he does not hold more than \$2500 worth of them.

Often boys and girls, with the help of their parents, use Postal Savings as a way to save money for a college education.

Things to Know About Postal Savings

Ten-cent savings stamps bear no interest. Amounts of \$1 or more may be exchanged for Postal Savings Certificates.

Postal Savings Certificates draw 2% interest, not compounded.

Certificates may be exchanged on January 1 and July 1 for Postal Savings Bonds in denominations of \$20, \$100, and \$500, drawing $2\frac{1}{2}\%$ interest, not compounded, payable semiannually. Application must be made at least 30 days before exchange date.

Accounts less than 3 months old do not draw interest.

Interest on deposits made after the first of any month begins the first of the month following.

1. John saves 10¢ every week. If he saves through the post office, what will he buy each week? Will these draw interest?

2. When John has saved \$1, what will he do so his savings will draw interest?

3. What is the advantage of changing certificates into Postal Savings Bonds?

4. How much interest will John receive each 6 months from a \$200 Postal Savings Certificate? From a Postal Savings Bond?

5. What are the advantages in buying a Postal Savings Bond? What are the advantages in buying a United States Savings Bond? See p. 140.

Mortgaging Property

Mr. Bell borrowed \$1000 from his bank to build a new barn. As security for the loan he gave the bank a \$1000 **mortgage** on his \$15,000 farm.

The mortgage was a written pledge giving the holder the right to sell Mr. Bell's farm if Mr. Bell failed to pay interest and payments on the loan when due.

1. What was the **principal** or amount of the mortgage on Mr. Bell's farm?

2. How much interest did he pay yearly if the rate of interest on the mortgage was 4%?

3. Mr. Bell bought \$2500 worth of machinery to modernize his farm. He gave his bank a **second mortgage** on his farm. The first and second mortgages together were what per cent of the value of his farm?

4. Mr. Bell paid 7% interest on his second mortgage. How much interest did he pay every 6 months?

5. If Mr. Bell's farm had to be sold to satisfy the mortgages, which mortgage would receive its principal and interest first? If there was any money left from the sale of the property after paying the second mortgage, to whom would it go?

6. Why is the rate of interest on a second mortgage higher than on a first mortgage?

Investing in Mortgages

1. Savings banks in many states cannot legally lend more than 60% of the property value on a mortgage. Why?

2. Banks require that property to be mortgaged be free from debt with taxes paid, and buildings on the property must be insured in favor of the mortgage holder. Explain.

3. The bank which lent Mr. Bell \$1000 on his farm (p. 151) did not hold the mortgage until it became due. The bank sold it to Mr. Lane. Did Mr. Lane make a sound investment? How can you tell?

4. Mr. Main bought a \$3000 mortgage, 6% interest. What was his yearly income from it?

5. Did Mr. Main earn more money on the mortgage than he would if he had put the \$3000 in a savings account in a bank in your town?

6. What should Mr. Main know about the mortgage before he decided to buy it rather than put his money in the bank?

7. Mr. Mack held a \$4000 first mortgage on Mr. West's farm, interest 5%, and Mr. Smith held a \$3000 second mortgage, interest 7%. Mr. West failed to make payments on the mortgages and his \$10,000 farm was sold for 85% of its value by the court. Figuring two years' interest what was paid to Mr. Mack? Mr. Smith? What did Mr. West receive?



The Tip-Off

Mark papers at the end of each section. Study the page in parenthesis if you make mistakes.

Section One (p. 146): Find the total cost of each bond below, brokerage \$2.00 per \$1000; interest dates January 1 and July 1.

	Face Value	Market Value	Interest Rate	Date Purchased
1.	\$6000	104	4%	June 1
2.	\$5000	95	3%	July 1

Section Two (p. 147): 3-4. Find the net proceeds from the sale of bonds 1-2 above.

Section Three (p. 148): Find the rate of interest paid on these bonds.

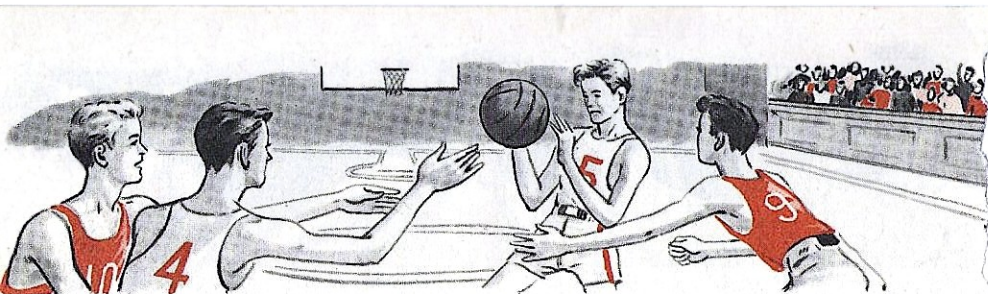
	Face	Interest		Face	Interest
5.	\$8000	\$240	6.	\$750	\$37.50
7.	\$4500	\$180	8.	\$250	\$8.75

Section Four (p. 148): Find the rate of income on money invested in these bonds.

9. Face, \$100; cost 80; interest 4%.

10. Face, \$100; cost 120; interest 6%.

If you did two or more sections without a mistake, work page 155. Otherwise, page 154 is for you!



Recovering the Ball

Write answers for the following. If you do not know the answer, the page in parenthesis before the question will help you.

1. (149) If you could save only \$.10 a week regularly, what would probably be the best way to invest your savings each week?

2. (140) Which of the following is the actual rate of interest on United States Savings Bonds, compounded semiannually?

2% 2.9% $3\frac{1}{3}\%$

3. (140) To secure United States Savings Bonds with a maturity value of \$1000, you must invest which of the following?

\$500 \$1000 \$750

4. (133, 151) A bond and a mortgage are alike in that both represent a loan. Yes or no.

5. (127) Is preferred stock a safer investment than common in the same company?

6. (125) What is the market price of 100 shares of A. T. & T. stock at 105?

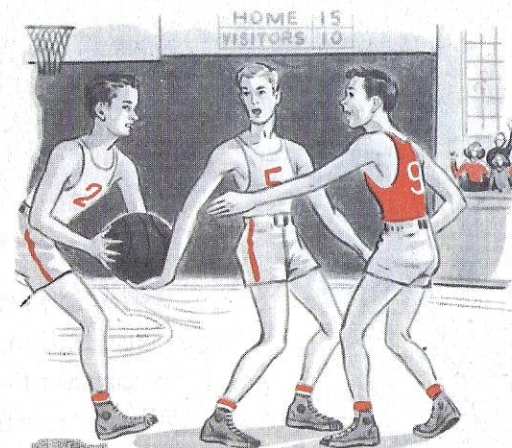
\$10,000 \$1050 \$10,500

7. (148) What is the rate of income on \$4500 invested in U. S. Steel 5s, face \$4000?

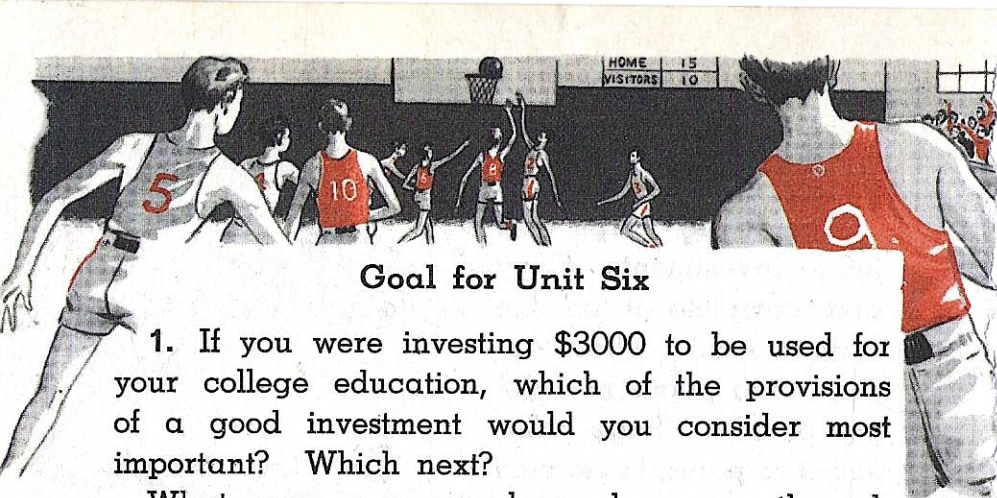
5% $4\frac{1}{2}\%$ $4\frac{4}{9}\%$

Passing the Ball

This table helps you judge investments. Copy and complete it on the blackboard. Then explain it to pupils now doing p. 154. Page references in parentheses may help you.



Kind	Safety	Earnings	Marketability
U. S. Gov't Bonds	Guaranteed by U. S. Gov't	Not high. Fixed rate.	Easily sold near par. Face paid at maturity.
State Bonds	(134)	Higher than U. S. Fixed.	Usually near par. Face at maturity.
Local Gov't Bonds	Guaranteed by Gov't issuing	Same as State Bonds.	(134)
Corporation Bonds	(144)	Higher than Gov't. Fixed.	Depends on standing of company. Face at maturity.
Mortgages	(151)	Depends on risk. Fixed.	Depends on risk. Face at maturity.
Preferred Stock	(127)	(127)	Depends on standing of company.
Common	Depends on company	Not fixed. Paid according to vote of directors and profits of company.	Depends on earnings and standing of company.



Goal for Unit Six

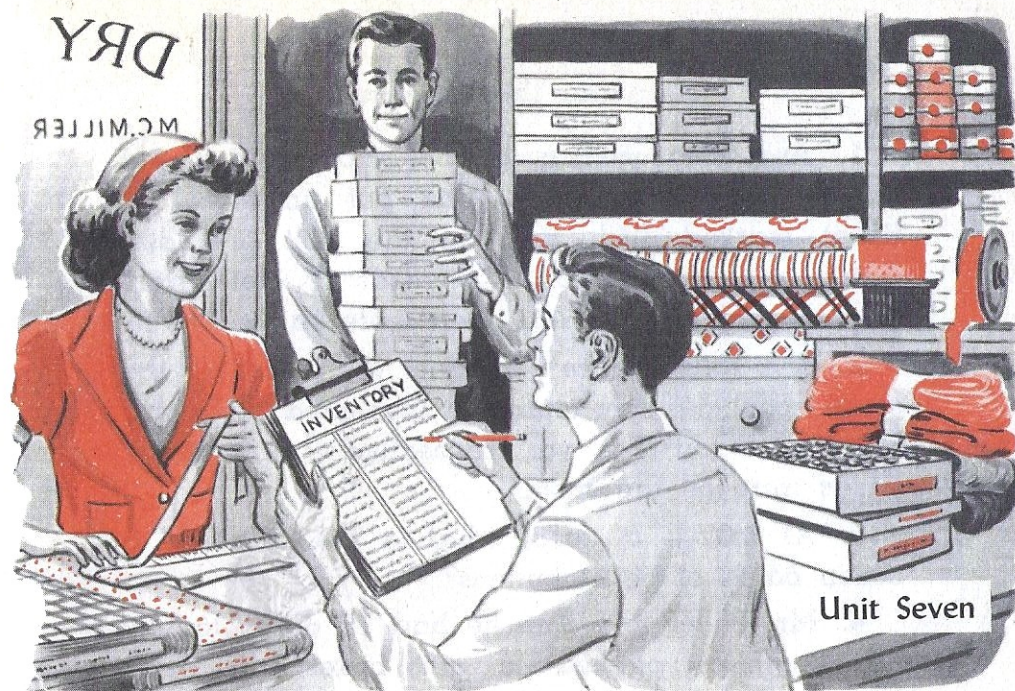
1. If you were investing \$3000 to be used for your college education, which of the provisions of a good investment would you consider most important? Which next?

What may a person buy who saves through the Postal Savings System if he has:

2. Less than \$1.00?
3. As much as \$1.00, but less than \$20.00?
4. Why is it an advantage to change Postal Savings Certificates into Postal Bonds?
5. Find the market value of \$6000 in American Ice bonds at $102\frac{1}{4}$; par \$100.
6. Del. P. & L. 4s, interest dates Jan. 1 and July 1, are bought Mar. 1. Find the interest due if the face of the bonds is \$5000.

What investment would you recommend for each of the following?

7. A newsboy who saves 50¢ a week.
8. A young man who earns \$40 a week and saves \$5, or slightly less, each week.
9. A widow who has \$15,000. She has very little income from any other source and must live largely on the income from this money. She owns her own home. She cannot risk losing the principal.



Unit Seven

Inventory Time

Ann and Don Miller are helping their father take inventory of the stock in his store. That is, they will help measure, count, list, and figure the price of all the stock in the store. Mr. Miller will then know exactly what he has on hand and what his present stock is worth.

1. How will he make use of this inventory in ordering more stock? In arranging special sales? In borrowing money for seasonal buying? In case the stock is damaged by fire?

2. Would it be wise if Mr. Miller took inventory more than once a year?

Figuring the Inventory

1. Ann measured a bolt of cloth and found it contained $7\frac{2}{3}$ yards. She put an inventory ticket marked, " $7\frac{2}{3}$ yd." on the bolt of cloth. Later a customer took $2\frac{1}{4}$ yards of cloth from that bolt. What did Ann then write on the ticket?

2. She rolled three remnants of ribbon on the same spool. If the remnants measured $15\frac{1}{2}$ yd., $10\frac{1}{4}$ yd., and $7\frac{2}{3}$ yd., respectively, how many yards were on the spool?

3. At $\$.07\frac{1}{2}$ a card, what is the value of 6 dozen cards of pearl buttons?

4. Mr. Miller told Ann he had 15 dozen ladies' handkerchiefs packed in gift boxes. If each box contained $\frac{1}{3}$ dozen handkerchiefs, how many boxes ought there be?

5. Ann counted 25 boxes of socks, each containing $\frac{1}{2}$ dozen pairs. How many dozen pairs of socks did these boxes contain?

6. A dress was marked to sell at \$7.95. Mr. Miller said that $\frac{1}{3}$ of that price was **mark up** (overhead and profit). What did Ann write as the cost of the dress?

7. A child's snow suit was marked to sell at \$16. Ann's father told her that 40% of this price was mark up. What was the cost?

8. What was the value of $18\frac{3}{4}$ yards of curtain material at $\$.33\frac{1}{3}$ a yard?

Arithmetic Such as Ann Used

Could you have done the arithmetic that Ann did? Here are four tryouts to test you. Work with a partner. Check after each tryout. If either of you makes mistakes, help each other with assignments following the tryout.

Tryout One: Add.

$$\begin{array}{r} 1. \quad 4\frac{1}{2} \quad 6\frac{2}{3} \quad 7\frac{4}{9} \quad 5\frac{3}{8} \quad 3\frac{5}{12} \quad 1\frac{1}{6} \\ \quad 3\frac{7}{8} \quad 8\frac{5}{6} \quad 1\frac{2}{3} \quad 4\frac{3}{4} \quad 7\frac{3}{4} \quad 4\frac{5}{9} \\ \quad 2\frac{5}{6} \quad 5\frac{3}{4} \quad 6\frac{1}{2} \quad 9\frac{1}{2} \quad 4\frac{2}{3} \quad 7\frac{11}{12} \end{array}$$

Assignments: Study pp. 30 and 31. Work p. 32 and p. 330.

Tryout Two: Subtract.

$$\begin{array}{r} 2. \quad 24\frac{3}{4} \quad 30 \quad 21\frac{3}{4} \quad 18\frac{2}{3} \quad 25\frac{5}{12} \quad 15\frac{2}{3} \\ \quad 5\frac{5}{8} \quad 9\frac{5}{6} \quad 19\frac{7}{8} \quad 3\frac{1}{9} \quad 10\frac{7}{9} \quad 14\frac{3}{4} \end{array}$$

Assignments: Study p. 34. Work p. 35 and p. 331.

Tryout Three: Multiply.

$$\begin{array}{r} 3. \quad 6\frac{2}{3} \times 4\frac{1}{5} \quad 7\frac{1}{2} \times 4 \quad 14 \times 2\frac{1}{7} \\ 4. \quad \frac{2}{3} \times 3\frac{3}{4} \quad 5\frac{1}{3} \times \frac{1}{9} \quad \frac{8}{9} \times \frac{3}{4} \end{array}$$

Assignments: Study pp. 36 and 37. Work p. 38 and Test I, p. 330.

Tryout Four: Divide.

$$\begin{array}{r} 5. \quad 10 \div 2\frac{1}{2} \quad 5\frac{5}{8} \div 1\frac{7}{8} \quad \frac{3}{4} \div \frac{1}{8} \\ 6. \quad \frac{3}{4} \div 2 \quad 12\frac{1}{2} \div 5 \quad 24 \div \frac{3}{4} \end{array}$$

Assignments: Study pp. 39 and 40. Work p. 41, and Test II, p. 332.

Invoice of Goods Shipped

INVOICE

ATLAS KNITTING MILLS

Minneapolis, Minnesota

December 11, 1948

Sold to: Miller Dry Goods Co.
Canton, Iowa

Terms 2% 10 days, net 30 days

Date	Amt.	Description			
12/8	2 doz.	Sport Shirts @ \$9.00 doz.	\$18 00		
	4 doz.	Light Weight Sweaters @ \$19.80 doz.	79 20		
			\$97 20		
		Less Trade Discount 25%	24 30		
				\$72 90	
12/9	6	Umbrellas @ \$2.00 each			
		No Discount		12 00	
				\$84 90	
				1 69	
				\$83.21	



Invoices and Discounts

Don wrote the exact cost of all goods on his inventory sheets. For new goods that had not been priced he figured the cost from the **invoice**, or memorandum of goods that came with the shipment.

1. What did Mr. Miller buy according to the invoice on page 160?

2. Give the **quoted** or **list price** of the things he bought.

3. On which articles did he get two discounts?

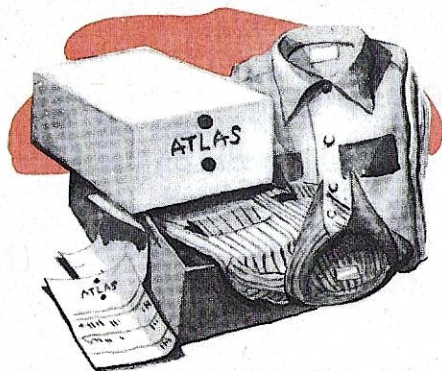
The first of the two discounts is a **commercial** or **trade discount**. Trade discounts are discounts taken from the list price for such reasons as buying in large quantities, clearing out seasonal goods, or attracting trade. A trade discount is not allowed on all goods. It is likely that Mr. Miller did not receive a trade discount on the umbrellas (p. 160) because the quantity bought was less than a dozen.

Use facts given in the invoice on page 160 to find:

- The trade discount on 2 dozen shirts.
- The trade discount on 1 dozen sweaters.

Net price = List price - Discount

- The net price of 2 dozen shirts.
- The net price of 4 dozen sweaters.



Successive Discounts

The second discount that Mr. Miller received on his invoice is a **cash discount**. *Terms 2% 10 days, net 30 days*, means that Mr. Miller can take 2% from the net amount of his bill if he pays within 10 days. This is called a cash discount because payment in 10 days is considered the same as paying cash.

1. What will Mr. Miller have to pay if he waits longer than 10 days?

2. Did the Atlas Mills take the 2% off, or did Mr. Miller deduct it when he paid his bill? Why?

3. Here is how Don figured the actual cost of the 2 dozen sport shirts that his father bought. Explain his work.

He thought: \$18.00 list price, with discounts of 25% and 2%.

These two discounts are **successive discounts**. That is, they are taken successively, or one after the other. The trade discount is taken off first, because it is a discount on the list price of the goods. The cash discount is taken after trade discounts, because it is a discount on the net price of the goods.

Don's Work

First Step: Find trade discount.

List price	\$18.00
$\times$ Rate of trade discount	$\times \frac{1}{4}$ (25%)
Trade discount	\$ 4.50

Second Step: Find net price.

List price	\$18.00
- Trade discount	- 4.50
Net price	\$13.50

Third Step: Find cash discount.

Net price	\$13.50
$\times$ Rate of cash discount	$\times .02$ (2%)
Cash discount	\$.27

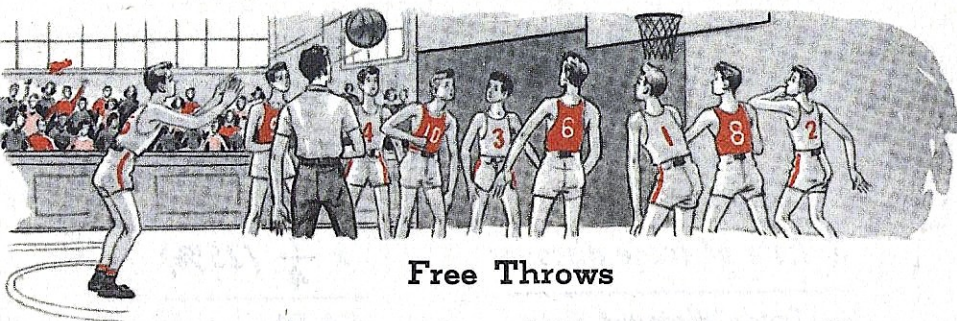
Fourth Step: Take cash discount.

Net price	\$13.50
- Cash discount	- .27
Amt. of bill or cost	\$13.23

4. Show how Don figured the actual cost of the 4 dozen sweaters; of the umbrellas.

Find the cost of the following:

Article	List Price	Trade Discount	Cash Discount
5. Dresses	\$60.00	20%	2%
6. Shoes	\$45.00	33 $\frac{1}{3}$ %	5%
7. Hats	\$24.00	25%	1%
8. Thread	\$15.00	None	5%



Free Throws

During inventory Don Miller used an adding machine to add columns like these. Work with a partner and try to get three perfect free throws. If you can, you do not need an adding machine.

First Throw:

1.	5	7	2	9	3	1	8	6
	8	4	9	8	4	2	6	0
	3	0	4	7	8	5	9	8
	5	9	3	5	8	0	7	9
	7	4	8	9	3	9	6	1

Second Throw:

2.	\$1.53	\$.69	\$5.74	\$.73	\$.56
	4.45	1.19	8.42	.09	2.70
	.73	.06	1.82	7.95	8.45
	9.75	6.95	2.50	7.75	6.98
	4.95	3.29	1.69	5.98	.89

Third Throw:

3.	\$125.50	\$523.00	\$ 38.70	\$1125.35
	56.75	112.30	200.67	5230.89
	237.42	94.98	455.75	2315.50
	557.98	450.75	299.50	1540.95
	875.50	560.95	259.95	3625.85

More Than One Trade Discount

In a wholesale dry goods catalog Ann saw the picture of a blanket she wanted to buy. It was marked: "No. A268. List, \$10.00." Her father said he had one in stock, but Ann told him she did not have \$10.00. He said he would sell the blanket to her for exactly what it cost him.

1. He told her he had received two successive discounts; 30% which he gets regularly on all A items in the catalog and 20% because he bought a dozen blankets. If he also got a 5% cash discount, what did one blanket cost? Think:

List price, \$10.00; discounts, 30%, 20%, 5%.

Explain:

$$\$10.00 \times .30 = \$3.00 \text{ 1st discount}$$

$$\$10.00 - \$3.00 = \$7.00 \text{ 1st discounted price}$$

$$\$7.00 \times .20 = \$1.40 \text{ 2nd discount}$$

$$\$7.00 - \$1.40 = \$5.60 \text{ net price}$$

$$\$5.60 \times .05 = \$0.28 \text{ cash discount}$$

$$\$5.60 - \$0.28 = \$5.32 \text{ actual cost}$$

2. Find actual cost of a coat: list price, \$25.00; discounts, 20%, 25%, and 2%.

Find actual cost of the following goods:

3. List, \$50.00; discounts, 25%, 10%, 2%

4. List, \$300.00; discounts, 40%, 5%, 2%

5. List, \$24.75; discounts, $33\frac{1}{3}\%$, 10%, 5%

6. List, \$98.00; discounts, 50%, 2%, 1%

7. List, \$150.00; discounts, 20%, 5%, 2%

Questions Ann Asked Her Father

1. Ann asked if customers ever see the whole-sale catalog. Her father said he shows the catalog to customers who wish to order things he does not have in stock.

2. She asked how he knew what discounts were allowed. He said catalogs have a confidential page telling what the discounts on different articles are.

3. Ann asked if it would not be better to print the net price instead of the list price in the catalog. Her father said she could answer that question herself. Can you?

4. She wanted to know whether he left the confidential discount sheet in the catalog. He said he tore it out and filed it. Why?

5. Ann said she thought it would be simpler to give a 50% discount than two successive discounts of 30% and 20%. Her father showed her that a 50% discount is not the same as discounts of 30% and 20%. Put the work on the black-board to prove he was right.

6. Make an invoice showing that on Oct. 1 the Zenith Hat Co., New York City, shipped to Mr. Miller 1 doz. hats, list price \$6.00 each; discounts 20% and 10%. Terms 5% 10 da., 30 da. net. Show that the bill was paid Oct. 7. Page 160 will help you.

Short Ways to Find Net Price

1. Don Miller wanted to find the net price on a suit listed at \$30, discount 20%. His father showed him a short way to find the net price by using either decimals or common fractions. Think:

List price - Discount = Net price

Using Decimals

$$100\% - 20\% = 80\%$$

$$\$30 \times .80 = \$24.00$$

Using Common Fractions

$$\frac{5}{5} - \frac{1}{5} = \frac{4}{5}$$

$$\$30 \times \frac{4}{5} = \$24$$

Using the short way find net prices of the following using decimals; then use common fractions.

2. \$500 less 25%

3. \$120 less 40%

4. \$9.50 less 5%

5. \$720 less 12½%

6. Explain and do the following work showing how Mr. Miller found the net price on \$30, when there were successive discounts of 20% and 25%. Check by working the long way.

Using Decimals

$$\$30 \times .80 \times .75 = ?$$

Using Common Fractions

$$\$30 \times \frac{4}{5} \times \frac{3}{4} = ?$$

Use the short way to find net prices of the following using decimals, then using common fractions. Check by working the long way.

7. \$600, less discounts of 10% and 20%

8. \$1500, less discounts of 40% and 20%

9. \$42.50, less discounts of 50% and 10%

Figuring the Selling Price

1. Review pages 70 and 71.

Mr. Miller estimated to the nearest thousands that the business of the past year had been: total sales, \$25,000; cost of goods, \$15,000; overhead, \$6,000; net profit, \$4,000.

2. The cost of goods was what per cent of the total sales?

3. The overhead was what per cent of the total sales?

4. The net profit was what per cent of the total sales?

Don looked up the totals of three previous years and found what per cent the cost of goods, overhead, and net profit were of the total sales for each year. Do the work that Don did to find these per cents.

	Sales	Cost	Overhead	Net Profit
5.	\$24,000	\$14,400	\$5760	\$3840
6.	\$30,000	\$18,000	\$7500	\$4500
7.	\$22,500	\$13,500	\$5625	\$3375

From the per cents Don found he discovered that each year his father's overhead was about 24% and his net profit about 16% of the sales. The cost of the goods was 60% of the sales in each case. Don thought this was very strange until Mr. Miller explained that it did not just happen that these per cents were so nearly alike each year.

He said it would be poor business to sell goods and then find whether you had made enough to pay expenses and have a fair profit for yourself. Instead, goods are priced so the selling price will cover cost, overhead, and net profit. That is, the selling price is the whole, or 100%.

8. Don asked his father to figure the selling price on a watch that cost \$18.00. His father priced it in three steps:

$$24\% \text{ overhead} + 16\% \text{ net profit} = 40\% \text{ margin}$$

$$100\% \text{ selling price} - 40\% \text{ margin} = 60\% \text{ cost}$$

$$\$18.00 \text{ cost} \div .60 = \$30.00 \text{ selling price}$$

9. What would the selling price have been if the watch cost \$24.00 and the margin was the same as in Problem 8?

10. Find the selling price of a watch that cost \$18.00 if the overhead was 30% of the selling price and the net profit was 6%.

Find selling prices of the following:

	Article	Cost Price	Overhead	Net Profit
11.	Purse	\$1.30	20%	15%
12.	Tie	\$.60	25%	15%
13.	Shirt	\$3.20	24%	12%
14.	Clock	\$8.50	$33\frac{1}{3}\%$	$16\frac{2}{3}\%$
15.	Chair	\$22.50	30%	25%

16. The margin (overhead + net profit) is often called the **mark-up**. Explain.

Your Inventory Time

An occasional inventory is useful in arithmetic classes, too. Do the following inventory sheets with a partner. You will find out how large your stock of arithmetic is for this year.

Inventory Sheet One

Do half of this sheet while your partner does the other. Check each other's work. Pages in parentheses will give special help.

Add. (pp. 7, 316-318)

1.	6	83	483	568	785639	45029
	9	89	604	384	721415	79892
	8	75	379	295	104936	54679
	<u>5</u>	<u>46</u>	<u>824</u>	<u>107</u>	<u>927344</u>	<u>60988</u>

Subtract. (pp. 11, 319-320)

2.	3514	18707	816949	1900	82790
	<u>2609</u>	<u>9425</u>	<u>27074</u>	<u>1099</u>	<u>70084</u>

Multiply. (pp. 13, 321-323)

3.	728	690	739	5900	32087	2004
	<u>406</u>	<u>300</u>	<u>713</u>	<u>69</u>	<u>795</u>	<u>5009</u>

Divide. (pp. 17, 324-326)

$$4. \quad 87 \overline{)43761} \quad 95 \overline{)19760} \quad 58 \overline{)34960}$$

$$5. \quad 285 \overline{)31041} \quad 298 \overline{)86955} \quad 465 \overline{)98000}$$

170

Inventory Sheet Two

Work one set of exercises while your partner works another. Exchange and check. Then help each other correct mistakes.

1-25. Add each fraction in Row B to each group of fractions in Row A. (pp. 29, 30)

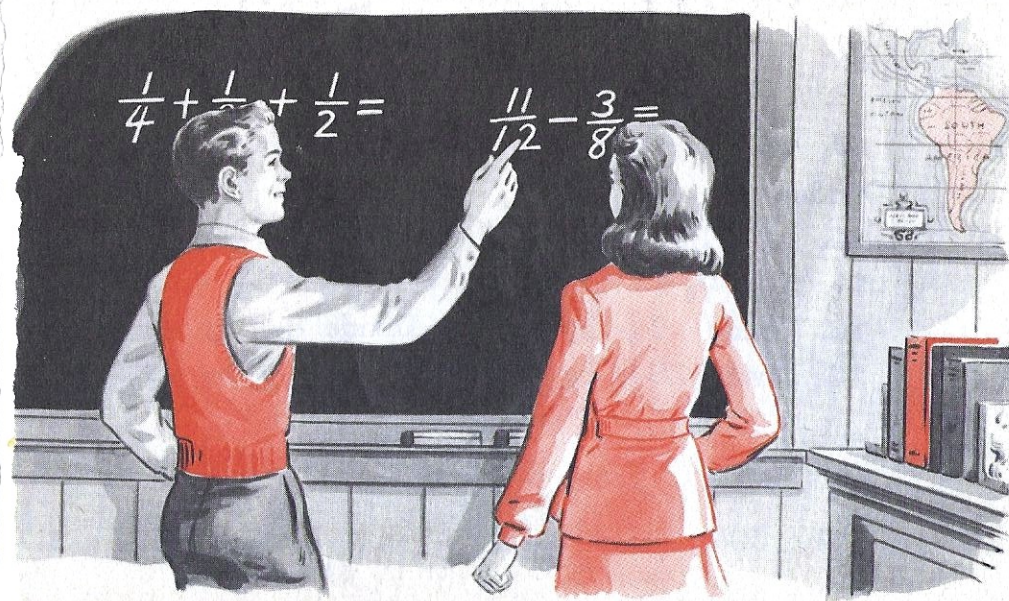
Row A	$\frac{1}{4}, \frac{1}{2}$	$\frac{5}{6}, \frac{7}{8}$	$\frac{1}{3}, \frac{3}{4}$	$\frac{2}{5}, \frac{3}{4}$	$\frac{7}{9}, \frac{1}{4}$
Row B	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{5}{6}$	$\frac{5}{8}$

26-89. Subtract each fraction in Row D from each fraction in Row C. (p. 34)

Row C	$\frac{7}{8}$	$\frac{7}{9}$	$\frac{11}{12}$	$\frac{5}{6}$	$\frac{2}{3}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{19}{24}$
Row D	$\frac{1}{2}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{12}$	$\frac{2}{3}$	$\frac{1}{6}$	$\frac{5}{9}$

90-114. Multiply each group of fractions in Row A above by each fraction in Row B. (pp. 36, 332, I)

115-178. Divide each fraction in Row C above by each fraction in Row D. (p. 39)



Inventory Sheet Three

Divide the work below equally between yourself and your partner. After each has worked his share, exchange and check papers. Help each other correct mistakes.

Add. (pp. 31, 32, 33, 330)

$$\begin{array}{r} 1. \quad 5\frac{2}{3} \quad 13\frac{5}{6} \quad 7\frac{3}{4} \quad 3\frac{4}{5} \quad 6 \quad \frac{7}{8} \quad 6\frac{5}{16} \\ \quad 2\frac{11}{12} \quad 6\frac{5}{8} \quad 15 \quad \frac{3}{4} \quad 3\frac{1}{8} \quad 4\frac{5}{6} \quad 9\frac{7}{8} \end{array}$$

$$2. \quad \frac{2}{3} + 3\frac{3}{4} + 72\frac{5}{6} = \quad \frac{7}{9} + \frac{5}{6} + 2\frac{3}{4} =$$

$$3. \quad 45\frac{7}{12} + 6\frac{4}{9} + 8\frac{3}{4} + 72\frac{2}{3} + \frac{1}{2} =$$

Subtract. (pp. 34, 35, 331)

$$4. \quad 8\frac{11}{12} \quad 7\frac{3}{4} \quad 12\frac{1}{4} \quad 8 \quad 6\frac{2}{3} \quad 6\frac{1}{5} \quad 7\frac{1}{2} \\ \quad 2\frac{1}{6} \quad 4\frac{7}{8} \quad \frac{5}{6} \quad 7\frac{2}{3} \quad 4 \quad 2\frac{1}{4} \quad 5\frac{7}{8}$$

$$5. \quad 62\frac{4}{5} - 34\frac{1}{2} = \quad 50 - \frac{7}{8} = \quad 29\frac{3}{8} - \frac{3}{4} =$$

Multiply. (pp. 36, 37, 38, 332, I)

$$6. \quad 6\frac{1}{5} \times 7\frac{1}{2} = \quad 9\frac{1}{3} \times 5\frac{1}{4} = \quad 9 \times 4\frac{1}{3} =$$

$$7. \quad 3\frac{3}{5} \times 4\frac{5}{6} = \quad 7\frac{7}{8} \times 2\frac{1}{9} = \quad 3\frac{1}{4} \times 1\frac{1}{3} =$$

$$8. \quad 1\frac{1}{2} \times 3\frac{3}{4} \times 1\frac{3}{5} = \quad 3\frac{3}{5} \times 6\frac{2}{3} \times 3\frac{1}{6} =$$

$$9. \quad 4\frac{1}{2} \times 3\frac{1}{3} \times 2\frac{3}{5} = \quad 2\frac{4}{7} \times 4\frac{1}{12} \times 4\frac{4}{5} =$$

Divide. (pp. 39, 40, 41, 332, II)

$$10. \quad 1\frac{3}{7} \div 1\frac{3}{4} = \quad 5\frac{2}{5} \div 2\frac{1}{10} = \quad 9\frac{1}{4} \div 2\frac{2}{3} =$$

$$11. \quad 5\frac{5}{8} \div \frac{9}{16} = \quad 35 \div 3\frac{4}{7} = \quad 4\frac{4}{7} \div 6\frac{2}{5} =$$

$$12. \quad \text{Divide } 3\frac{1}{9} \text{ by } 1\frac{2}{7}. \quad \text{Divide } 8\frac{1}{2} \text{ by } \frac{1}{4}.$$

$$13. \quad \text{Divide } 25\frac{2}{3} \text{ by } 4\frac{1}{7}. \quad \text{Divide } 4\frac{1}{5} \text{ by } 6\frac{3}{10}.$$

Ann and Don Study an Advertisement

The alert girl or boy takes advantage of every opportunity to learn. Ann and Don studied the graph below until they understood it and could solve problems made about it.

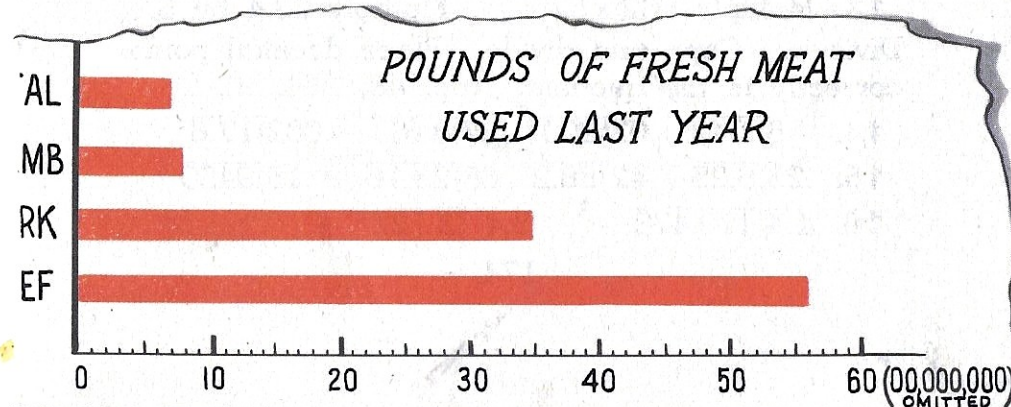
1. Write and then read the number of pounds of beef used last year. Remember that eight 0's must be annexed to the number read from the graph.

2. Write and then read the number of pounds of pork used; of lamb; of veal.

3. The population of the United States was about 140,000,000. What was the average number of pounds of fresh beef used per person last year?

4. Use the population given in Problem 3 and find the average number of pounds of fresh pork used per person last year; of lamb; of veal. Find each answer correct to the nearest whole pound.

5. We used about 700,000,000 chickens, ducks, and turkeys last year. How many was this per person?



Inventory Sheet Four

Do half of the following inventory while your partner does the rest. Exchange and check papers. Review the pages given in parentheses if you make mistakes.

Addition: Copy carefully in columns and add. (pp. 43, 44, 333, I)

1. $3.62 + .75 + 2.33 =$ $83.2 + 5.7 + .9 =$
2. $345.7 + 71.5 + .6 =$ $.75 + .22 + 89 =$
3. $90.2 + .6 + 3.5 =$ $68 + .53 + 11.05 =$
4. $4.5 + 12 + .1 =$ $259 + 56 + .9 =$
5. $200 + 2.2 + 5.1 =$ $46.15 + 2.50 + 7 =$

Subtraction: Copy in columns and subtract. (pp. 43, 44, 333, II)

6. $28.6 - 12.5 =$ $89 - .47 =$ $1.45 - .65 =$
7. $3.002 - 2.145 =$ $7 - .005 =$ $52.4 - 9 =$
8. Take .07 from 200. Take 1.45 from 15.
9. Take 5.2 from 6.2. Take 1.23 from 28.

Multiplication: Copy and solve. Place decimal points in proper places. (pp. 45, 334, I)

10. $.16 \times 5.3 =$ $7.4 \times 8.2 =$ $.35 \times .65 =$
11. $9.27 \times .4 =$ $.025 \times .05 =$ $279 \times .05 =$
12. Multiply .455 by 9. Multiply 7.2 by .4.
13. Multiply 562×520 . Multiply 23.4 by 5.

Division: Copy and divide. Place decimal points correctly in the quotient. (pp. 48, 334, II)

14. $6 \overline{)0.42}$ $.03 \overline{)900}$ $.7 \overline{)8.61}$ $.002 \overline{)17.6}$
15. $.25 \overline{)6.25}$ $42 \overline{)88.2}$ $68 \overline{)25.16}$ $.15 \overline{)9450}$
16. $1.4 \overline{)170.478}$ $5.4 \overline{)13.122}$

Inventory Sheet Five

For help refer to the page indicated in parenthesis.

1. Jerry lost $\frac{1}{80}$ of his weight. Change this fraction to a per cent. (56)

2. Tom earns \$7.50 a week. If he saves $33\frac{1}{3}\%$ of his earnings, what will he save in a year? (57)

3. Jim and Bill together earned \$4.00 cutting grass. Jim worked 5 hours, and Bill worked 3 hours. If both got the same wages per hour, what did each receive? (46)

4. Ruth has 560 quilt squares. Of these 210 are red, and the rest are white. What per cent of the squares are white? (59)

5. The selling price of a vase was \$4.95. If it was reduced to \$3.96, what per cent of the selling price was the reduction? (59)

6. Joan earned 35% commission selling magazines. If her commission was \$10.50, what was the amount of her sales? (66)

7. Jim borrowed \$2500 at 3%. What did he pay back at the end of 4 months? (89)

8. If you paid \$7.50 interest on \$150 for each year, what rate would this be?

Use the interest table (p. 96) and find the simple interest on the following:

9. Principal, \$500; rate, 6%; time, 75 da.
10. Principal, \$60; rate, 3%; time, 96 da.
11. Principal, \$700; rate, 2%; time, 12 da.

Inventory Sheet Six

Pages in parentheses give special help.

Use the table on page 99 to find the compound interest on the following:

- | Principal | Rate | Compounded | Time |
|-----------|------|------------|--------------------|
| 1. \$600 | 3% | Annually | 5 yr. |
| 2. \$720 | 4% | Annually | 4 yr. |
| 3. \$900 | 2% | Annually | $2\frac{1}{2}$ yr. |
| 4. \$800 | 4% | Annually | 3 yr. |
- Find the exact time from Jan. 5, 1948 to March 11, 1948; from Dec. 5, 1948 to April 15, 1949. (93)
 - Find the exact interest from May 5 to June 4 on \$800 borrowed at 4%. (93)
 - Find the net proceeds of a \$300 note discounted Aug. 11, due Nov. 9, interest at 6%. (94)
 - Mr. Ames allows an average of \$22.40 a week for foods. If this is 32% of his weekly income, what does he earn per year? (57)
 - Find the cost of 25 shares of Penn. R. R. stock at 104, brokerage $\frac{1}{4}$. (124, 125)
 - Find the rate of income on 4% stock, par 100, bought at \$75 a share. (128)
 - Find the market value of a \$5000 bond quoted at $102\frac{3}{4}$. (136)
 - Find the total cost of a \$2000 bond quoted at 98, brokerage \$2.50 per \$1000. (146)
 - Find the rate of interest on a \$4000 bond paying \$200 interest annually. (148)

Gaining Strength in Problem Solving

How many can you solve without a pencil?

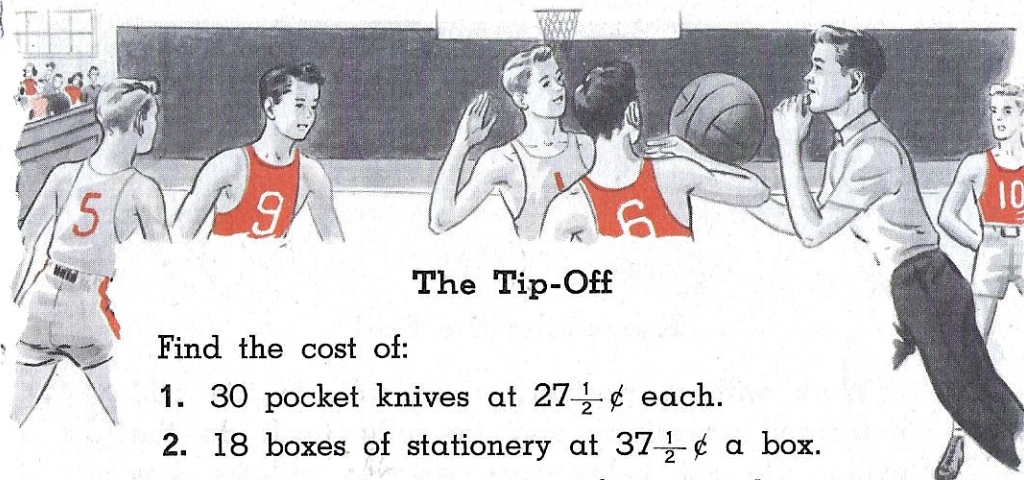


- What is the cost of 40 large buttons at $2\frac{1}{2}$ cents each?
- A dress marked to sell for \$12 was sold at a discount of 25%. What was the selling price?
- Ladies' hose were marked up 40% and sold for \$1.50 a pair. What was the cost? Remember, the percentage of mark-up is based on the marked price.
- Shoes that cost \$2.50 were sold for \$3.75. What was the percentage of mark-up?
- A sweater costs \$3. The mark-up is to be 40%. What should the marked price be?
- Mr. Miller sold 160 hats last year and expects to sell 25% more this year. How many does he expect to sell this year?
- What is the value of $6\frac{3}{4}$ dozen small handkerchiefs at 10 cents each?
- Mr. Miller paid \$9 for a dress and marked it to sell for \$15. What was the percentage of mark-up?
- One and two-thirds dozen buttons were sold for 60 cents. What was the price per dozen?
- Mr. Miller sold 240 sport shirts last year. This was 20% more than he sold the year before. How many did he sell the year before last?

Testing Mixed Fundamentals

The girls will race against the boys. Stand the instant you have finished. Count the number of pupils who have finished before you. Write the next number on your paper. After all have finished, see if the first 50% to finish were mostly boys or girls. Check papers. Which side had the larger number of perfect papers? Which is more important, speed or accuracy?

1. Find the sum of 4982, 6925, and 8294.
2. Find the sum of 29, 896, and 9.
3. $14\frac{7}{8} + 8\frac{5}{6} + 1\frac{3}{4} =$
4. $18\frac{2}{3} + 625 =$
5. $.45 + 7.48 + 346 =$
6. From 350,701 subtract 53,819.
7. From 9000 subtract 4.
8. $17\frac{3}{8} - 13\frac{3}{4} =$
9. $\frac{5}{6} - \frac{3}{8} =$
10. $67 - 1.597 =$
11. Multiply 6908 by 406.
12. Multiply 1.983 by 10.07.
13. $2\frac{2}{5} \times 8\frac{1}{3} =$
14. $\frac{7}{24} \times 16 =$
15. $5270 \times .006 =$
16. Divide 39480 by 168.
17. Divide 196,833 by 637.
18. $3\frac{5}{9} \div 8 =$
19. $4\frac{1}{6} \div \frac{5}{9} =$
20. $35 \div .005 =$



The Tip-Off

Find the cost of:

1. 30 pocket knives at $27\frac{1}{2}\text{¢}$ each.
2. 18 boxes of stationery at $37\frac{1}{2}\text{¢}$ a box.
3. $24\frac{2}{3}$ yards of lace at $5\frac{3}{5}\text{¢}$ a yard.

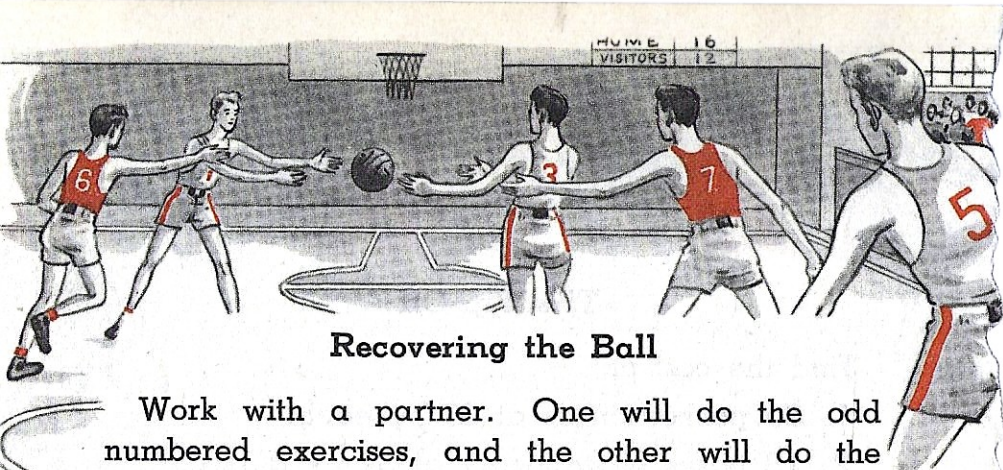
A grocer paid \$3.00 for a box of 136 grapefruit. One was bad. He sold the rest at 3 for 10¢.

4. What was the selling price of all?
5. What was his margin?
6. What per cent of the selling price was the cost?
7. If he figured that $16\frac{2}{3}\%$ of the selling price was overhead, what was his net profit?

Find the net price of the following:

8. \$350; discounts 10% and 20%
9. \$500; discounts 25%, 10% and 2%
10. \$1250; discounts 30%, 15% and 5%
11. Find the net price of goods listed at \$50, $\frac{1}{4}$ and $\frac{1}{3}$ off.

If you had ten right answers, page 181 will put your skill to a greater test. Otherwise do page 180 to gain more skill.



Recovering the Ball

Work with a partner. One will do the odd numbered exercises, and the other will do the even. Do not help your partner until he has had a fair trial.

Give the correct expression for each blank.

1. Mr. Rice is a furniture dealer. His wholesale catalogs tell him the (a) price of articles. He gets two or more (b) trade discounts on some articles and a (c) discount for prompt payment. To figure the selling price he adds his margin to the (d). He figures that the selling price is (e) %.

2. List price - discount = (a)

Margin - (b) = net profit

Cost + overhead + net profit = (c)

Mark-up is another name for (d).

3. A merchant found that his sales for one month were \$2,568. If his overhead was 16% and his net profit was 12%, find his overhead; his net profit; his margin; the cost of the goods.

4. John is saving to buy a bicycle which he saw in a catalog marked "list price \$40, less 20 and 10." What must he save to buy this one?

Passing the Ball

1. Mr. Alt sells vacuum cleaners. He gets \$1.50 for each demonstration he gives and 10% of his sales. Last month he made 85 demonstrations and sold 21 cleaners at \$59.50 each. How much did he earn?

2. An article costing \$1.50 is to be sold at a margin of 25% of the selling price. Find the selling price.

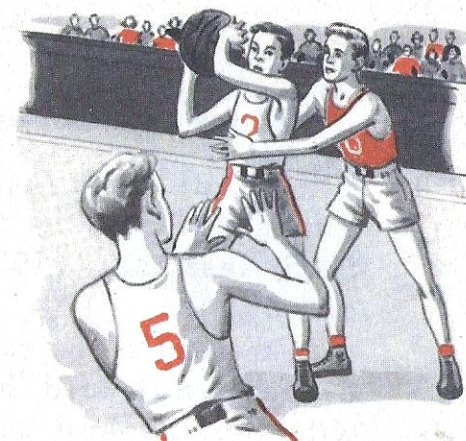
3. Mr. Roberts wants to order some tables with a list price of \$5.00. On orders of less than 10 tables the discount is 30%. If Mr. Roberts orders 8 of these tables, what will be the net price of the order, taking a discount of 5% for cash?

4. On orders of 10 or more tables, the same company gives a discount of 30% and 10%. If Mr. Roberts buys 15 tables, what is the net bill after he takes a cash discount of 5%?

5. Find how much Mr. Roberts saves on each table by buying 15 instead of 8.

6. If the actual cost of one table was \$3.00, and Mr. Roberts wished a 75% mark-up, what was the selling price?

7. At a sale he sold the tables for \$6.00. What was his margin at this price?



Goal for Unit Seven

1. What is the net cost on a bill of drugs for \$875, less 20%, 15%, and 5%?

At the end of the year a merchant told his wife that he had sold about \$24,600 worth of goods the previous year. The goods had cost about \$15,375, and his overhead was about \$6,150.

2. What was his net profit?

3. What per cent of the total sales was his overhead?

4. His profit was what per cent of his sales?

5. His margin was what per cent of his total sales?

A certain grocer figures that his overhead is 30% and he prices his goods so he can make a 10% profit. What must he charge his customers for the following?

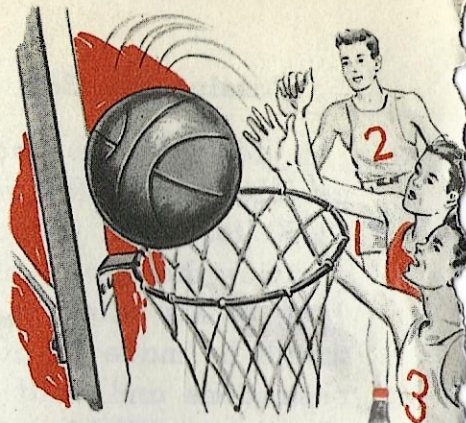
6. One can of corn, if he pays \$3.36 for one case containing 24 cans.

7. One dozen eggs, if he pays \$10.50 for a crate containing 30 doz.

8. One pound of coffee if it costs 21¢ a pound.

9. One broom if he paid \$3.36 a dozen.

10. One loaf of bread costing \$2.52 for 3 dozen.



TO BE CONTINUED

